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President.

THE MORTALITY FROM CANCER THROUGHOUT THE WORLD

BY

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TO

THE AMERICAN SOCIETY FOR THE
CONTROL OF CANCER

AND

THE AMERICAN ASSOCIATION FOR
CANCER RESEARCH

FREDERICK L. HOFFMAN
STATISTICIAN

THE PRUDENTIAL INSURANCE COMPANY
OF AMERICA
HOME OFFICE, NEWARK, NEW JERSEY

May 10, 1915.

Mr. Forrest F. Dryden, President.

Dear Mr. Dryden:

Nearly two years ago an invitation was extended to me by the president of the New Jersey Academy of Medicine, Dr. Edward J. Ill, of Newark, to address that society on some subject of my own selection. After careful consideration I agreed upon a discussion of "The Menace of Cancer," as in the light of our own experience perhaps the most important medical problem demanding special attention along lines of public and individual control. This subject had for some years past been given more or less consideration as one of increasing significance in life insurance medicine, best emphasized in the statement that at ages forty-five and over, in our Ordinary experience of 1914, 9.6 per cent. of the deaths of males and 18.6 per cent. of the deaths of females were the result of malignant disease.

The address was delivered on March 26, 1913, and subsequently, upon the urgent invitation of the American Gynecological Society, was, with many additions and new illustrations, brought before that important body, at a meeting held in Washington on May 7, 1913. Some time previous, however, steps had been taken to develop an organized effort for a nation-wide educational cancer movement, and accordingly, on May 22, 1913, the American Society for the Control of Cancer was formed. This association has since become an influential body, aiming primarily at the widest possible dissemination of the salient facts of the cancer problem and the clear recognition on the part of the public of the supreme importance of the earliest possible diagnosis and the qualified treatment of the disease in its initial stage. The public aspects of the cancer question are best emphasized in the statement that the mortality from cancer in the Continental United States now exceeds 80,000 per annum, and that the rate of mortality from this disease is increasing approximately 2.5 per cent. per annum. A considerable proportion of the mortality is, in part at least, directly attributable to public ignorance and neglect of known measures and means by which the mortality can be materially reduced.

In the organization of the American Society for the Control of Cancer I was honored with the position of Chairman of the Committee on Statistics. The additional members of this Committee are Dr. James Ewing of the Cornell Medical School, New York City, and Dr. Joseph C. Bloodgood of The Johns Hopkins Hospital, Baltimore. The Committee has given extended consideration to many important statistical questions; but it was early realized that the efforts of the Society would be materially advanced by a concise presentation of the statistical evidence regarding cancer frequency throughout the United States and the remainder of the civilized world. The need of trustworthy statistical information was especially realized in connection with the work of local committees and the nation-wide effort to place the salient facts of the existing cancer situation before the public in a readily comprehended form. In aid of this educational propaganda I have had occasion to

address many such meetings throughout the country, and naturally in each and every case my own observations and conclusions were chiefly sustained by an appeal to the actual facts of cancer occurrence in the locality or sections in which the meetings were held.

A large amount of exceptionally useful statistical information was thus brought together, and since the material would unquestionably be of great practical value, not only to those directly interested in cancer education, but also to the medical profession generally and to specialists engaged in cancer research, it seemed but a public duty on our part to make the data more generally accessible to the public at large. The suggestion was therefore brought to your attention, and you were good enough to approve of my recommendation that a work of this character should be published by The Prudential, as perhaps the most substantial aid to be rendered by the Company in the furtherance of the cause of cancer control. The broadening of the plan and scope of the original inquiry has expanded the work into one of considerable size, but the general usefulness of the results has thereby been proportionately increased.

The entire matter is now resubmitted to you for your final approval, with the suggestion that the work be dedicated to the American Society for the Control of Cancer and the American Association for Cancer Research. It is further recommended that the work be made available for gratuitous distribution, with the compliments of The Prudential, to medical libraries, members of the medical and surgical professions, and to all others especially interested in the cancer cause and the problem of cancer control.

In conclusion, I make use of this opportunity to express to you my sincere personal appreciation of the broad-minded position which The Prudential has taken in this as well as many other questions relating to the activities of health-promoting agencies. In the furtherance of nation-wide efforts to reduce mortality and to prolong the duration of human life we have frequently been able to render scientific assistance of practical and permanent value. I feel sure, however, that whatever we may have done in the past, especially as regards our cooperation in the campaign against tuberculosis; in the prevention of industrial accidents; and in the gradual reduction of the mortality from acute infectious diseases of infancy, etc., the service which the present publication will render in the world-wide quest for the whole truth of the cancer problem and the effective control of malignant disease is certain to prove the most substantial of all.

I remain very truly yours,

Frederick L. Hoffman

Statistician.

Approved:

Forrest F. Dryden

President.

Public Health
4-11-44

PREFACE

The practical importance of cancer to life insurance companies is precisely shown in the statement that out of 5,529 deaths from all causes in the Ordinary experience of The Prudential during 1914, 416 deaths, or 7.5 per cent., were from malignant disease, or 6.4 per cent. of the mortality of males and 12.0 per cent. of the mortality of females. Limited to ages forty-five and over, the Ordinary experience of the Company for the year 1914 shows that of the deaths of males 9.6 per cent. were from cancer, against 18.6 per cent. of the mortality of females. Cancer was the third most important cause of death among males at ages forty-five and over, and the leading cause of death in the corresponding mortality of insured women. The exceptional importance, therefore, of the cancer problem to life insurance companies will not be called into question by any one familiar with the general facts of the cancer situation and aware of the lamentable truth that there are now annually over 80,000 deaths from malignant disease in the Continental United States and that the disease is increasing at the approximate rate of 2.5 per cent. per annum. If the present rate of increase continues unchecked, the annual cancer mortality in the Continental United States will soon exceed 100,000!

The present work is primarily intended to facilitate the statistical study of the cancer problem throughout the world. On account of the exceptional facilities for statistical inquiry available through the library of The Prudential and the hearty cooperation of officials of the Federal Government, the several states and many foreign countries, a large amount of entirely new information is made conveniently accessible to the student of the cancer problem, to the medical profession and to the general public. The main results of the investigation may be summed up in the brief but extremely suggestive statement *that the actual frequency of malignant disease throughout the civilized world has been ascertained to be much more of a menace to the welfare of mankind than has generally been assumed to be the case, and that in contrast to a marked decline in the general death rate, cancer remains one of the few diseases actually and persistently on the increase in practically all of the countries and large cities for which trustworthy data are obtainable.*

In a work of this kind minor errors are, naturally, not entirely avoidable, but a special effort has been made to reduce the chances of clerical mistakes to a minimum by several thorough and independent revisions of the numerous statistical tables appended to the text. Wherever practicable the source of the information used is indicated, and full credit has been given to authors quoted or consulted, aside from a fairly complete bibliography, limited to works actually made use of, nearly all of which are in the library of The Prudential. It would be quite impossible to make mention by name of all the many correspondents throughout the world, government officials, officers of life insurance companies, and others, who have most courteously and considerately rendered

valuable aid and without whose aid the results of this investigation would have been materially diminished in practical utility. Among those, however, who have rendered exceptionally useful personal assistance, mention should be made of Lieutenant-Colonel C. E. McCulloch, Jr., Librarian of the Surgeon-General's Library, Dr. Cressy L. Wilbur, former Chief Statistician for Vital Statistics of the United States Census, and Mr. R. C. Lappin, the acting chief of that office, Dr. Joseph C. Bloodgood, Dr. Thomas S. Cullen, Dr. James Ewing, Dr. H. R. Gaylord, Dr. Edward J. Ill, Dr. William L. Rodman, Dr. Harry M. Sherman, Dr. J. H. Wainwright, Dr. Francis Carter Wood and Dr. W. A. Jaquith, Medical Director of The Prudential.

All of the statistical tabulations and supplementary calculations have been made in our office under my immediate direction and supervision; but efficient and valuable assistance has been rendered by Mr. Frederick S. Crum, Ph. D., Assistant Statistician of The Prudential, who has carefully revised the entire proof, and provided a complete index, by authors and subjects. Among the clerks deserving of mention are Mr. Roy F. Edwards, who has revised and corrected the statistical tables for the United States and its subdivisions, Mr. Knud Stoumann, who has had entire charge of the foreign tables, Mr. Thomas J. Garvey, who has made the final general revision of rates and ratios, and Mr. Edwin E. A. Fisher, who has drawn the twenty-one charts illustrating the salient facts of the cancer problem. The bibliography is largely the work of Miss Adelaide S. Rinck. The printing of the work by the Prudential Press has involved many technical problems and an unusual demand for painstaking attention to minute details in the corrections and final proofreading of the text and tables. These difficulties were successfully overcome through the efficient assistance and hearty cooperation of Messrs. J. W. McLaughlin, C. E. Lund and J. J. Macbride, of our Printing Department. The artistic design of the charts is the work of Mr. Edwin S. Fancher.

The work is divided into nine chapters, to all but one of which there is an appendix of forms or tables, which, as a matter of convenience, have been placed together at the end of the volume. Chapter I, on The Statistical Method in Medicine, is amplified by an appendix of the principal cancer classifications, past and present, used in standard text-books and in the compilation of international cancer mortality statistics. This appendix also includes a useful classification of accessible, inaccessible and intermediate malignant tumors, as recommended by the Imperial Cancer Research Fund. Chapter II, on The Statistical Basis of Cancer Research, is a brief discussion of the fundamental statistical facts available for analysis, enlarged by an appendix of the blanks and certificates used in connection with cancer mortality investigations and special research, including the question form for cancer census purposes recommended by the International Association and the special blanks for supplementary inquiries into the facts and circumstances connected with the occurrence of cancer of the uterus, mammary cancer, gastric cancer and cancer of the buccal cavity, adopted and recommended by the Statistical Committee of the American Society for the Control of Cancer, in cooperation with the General Memorial Hospital of the City of New

York. Chapter III, on The Increase in Cancer, is an extended discussion of the general problem of the observed upward tendency of the cancer death rate throughout the world. The required statistical evidence in support of the conclusion that cancer is actually and not only apparently on the increase is, however, included in the appendices to the several chapters on the geographical incidence of cancer in the United States and foreign countries. The Mortality from Cancer in Different Occupations is discussed in Chapter IV, with an appendix of eight tables of the mortality from cancer in selected industries and employments, derived from the decennial reports of the Registrar-General of England and Wales, but rearranged and recalculated for the present purpose. In addition, the appendix includes cancer mortality data by occupations, derived from the Industrial mortality experience of The Prudential and the cancer census of Hungary. Chapter V presents an extended discussion of Cancer as a Problem in Life Insurance Medicine, historically and practically considered, with an appendix of 121 tables, including a concise and uniform presentation of the general cancer experience data of a large number of American and foreign life insurance companies and the collective results of the Medico-Actuarial Mortality Investigation. Chapter VI, on The Geographical Incidence of Cancer Throughout the World, brings out forcibly the wide range in the cancer frequency rates of different countries and cities with widely varying circumstances of race, climate, habits, etc., all of which are shown to have an important bearing upon the cancer problem as a whole. Included in this chapter are the results of a special analysis of the data collected by the New York State Institute for the Study of Malignant Disease concerning the primary seat of growth, probable cause, the personal and family history, etc. The information is made available for the first time through the courtesy of the Director of the Institute, who placed the original material at our disposition for tabulation and analysis. The principal tables of the appendix to this chapter show the facts of cancer mortality according to latitude, size of cities and the local rates of incidence by organs and parts of the body for thirteen representative countries throughout the world. In Chapter VII, on The Statistical Data of Cancer Frequency in American States and Cities, the rate of cancer occurrence throughout the United States is discussed at some length, and amplified by an appendix of 259 tables of cancer mortality for the registration area and for the several states and cities in a uniform manner and with a due regard, as far as practicable, to the elements of age, sex, race, organs and parts, etc. Chapter VIII presents the corresponding information on The Statistical Data of Cancer Frequency in Foreign Countries, with an appendix of 389 tables for countries other than the United States. Chapter IX concludes the results of the statistical inquiry with Some General Observations and Conclusions on the Cancer Problem. This is a general discussion of practically all the more or less controversial aspects of the cancer question, with a first regard, however, to sociological, anthropological and general scientific consideration. The observations are included as a matter of convenience to aid those who wish to make practical use of the statistical information, and they are not to be

construed as a final expression of qualified medical opinion regarding any or all of the controversial aspects of the world-wide quest for the whole truth of the cancer problem. The appendix to this chapter includes reprints of suggestive educational circulars used in connection with the nation-wide propaganda for cancer control under the auspices of the American Society for the Control of Cancer, etc.

The cancer question is as old as the history of medicine, and the literature of oncology in all its branches is enormous. Regardless, however, of all that has been written and said upon the subject, there can never come a time when the field of statistical inquiry will be exhausted. Verifiable progress in the direction of health and longevity requires the use of the statistical method, impartially applied to the subject under consideration. Cancer is apparently the most involved and practically difficult problem in the entire science and art of medicine and surgery. An army of men of the highest order of intelligence have been at work for many years in quest of the cancer cause and a cancer cure. Statistics, it is true, is but an auxiliary science, but it is one of great promise in the furtherance of medical research; for, after all, the study of collective phenomena, regardless of innumerable possibilities of error or false conclusions, provides the only trustworthy means of determining with approximate accuracy the existing amount of disease and the apparent tendency towards improvement or deterioration, as the case may be. It is readily to be conceded that the data are often faulty or incomplete, but this is not a fatal objection. The betterment of our vital statistics requires the cooperation of the medical profession, life insurance companies, public health officials and all others directly or indirectly interested in the prolongation of life and the prevention of disease. In proportion as the practical utility of vital statistics is better understood and more generally appreciated, the required perfection of fundamental mortality data will be brought nearer to the attainable ideal.

The results of the present investigation emphatically prove the imperative need of uniformity in the rules of statistical practice and the adoption of standard forms and blanks for cancer inquiries. The main shortcomings of the investigation are attributable to the want of uniformity in methods of classification and the more or less abbreviated presentation of the original facts provided by the death certificate. It is sincerely to be hoped that the results, inadequate as they are, will suggest the necessity for an international agreement regarding general conformity to the best methods at present in use. Such an improvement can be brought about only by the cooperation of all who are directly and impartially interested in cancer study and cancer research. Until the ideal is attained and uniform methods of classification and completeness of records are secured for all the countries of the civilized world, the present work will at least serve the purpose of having made the existing statistical facts of cancer frequency available in a convenient form. In its final analysis, the essential requirement is not the absolute truth, but the approximate or relative truth. For all practical purposes the latter is fully sufficient, and serves as a safe and satisfactory guide in all the ordinary affairs of life. Conceding frankly the inherent defects and shortcomings of existing statistical data and present-day methods of

statistical tabulation and analysis, it would seem to be an entirely safe assumption that, in the main, the general conclusions based upon the available statistics of human mortality throughout the world are approximately correct and trustworthy in the advancement of the aims and ideals of a world-wide associate effort at the prolongation of life and the prevention of disease. It is therefore to be hoped that the present work may render substantial assistance toward the attainment of this purpose, that it may lighten the labor of those in need of statistical data required in other lines of specialized cancer research, that it may emphasize concretely and conclusively the truly tremendous social and economic importance of malignant disease as a cause of death in adult life, and that it may accelerate the effort to disseminate the whole truth regarding this insidious affliction among the general public and emphasize the supreme necessity for early diagnosis and early qualified medical or surgical treatment. If the investigation contributes measurably towards the realization of these aims and ideals, the results, though at first quite general in their nature, must ultimately react favorably upon the vast business of life insurance companies, which are primarily and preeminently interested, on behalf of their policyholders, in any and all measures aiming at the deliberate prevention and control of disease and the highest attainable average duration of human life.

F. L. H.

Newark, N. J., May 2, 1915.

TABLE OF CONTENTS

CHAPTER I — PAGE

The Statistical Method in Medicine 1

Sources of Statistics—Principles of Analysis—Terminology—Difficulties of Diagnosis—Early History—Past and Present Methods of Classification—Natural History of Cancer—Standardized Death Rates—Function of Age and Senility—Ethnic Factors—Question of Cancer Increase—Death Certification and Classification.

CHAPTER II

The Statistical Basis of Cancer Research 21

Limitations of Statistical Analysis—Difficulties of Precise Classification—Early Observations on Cancer Statistics—Need of an Exhaustive Study—Uniform Methods of Tabulation and Analysis—Recognition of Cancer—Importance of Microscopical Research.

CHAPTER III

The Increase in Cancer 28

Early Mortality from Cancer in London—Causes of Local Variations—Argument by King and Newsholme—Statistics of Frankfurt a/M.—Increase in Cancer by Organs and Parts—Utility of a Cancer Census—Cancer among Primitive Races—Statistical Problems of Erroneous Diagnosis—Evidence of Cancer Increase throughout the World—Misleading Statistical Observations—Useless Controversies—Trustworthiness of American Mortality Statistics—Contributory Causes of Death in Cancer—Continued Increase in Cancer Frequency—Public Menace of Ignorance and Indifference.

CHAPTER IV

Mortality from Cancer in Different Occupations 48

Review of the Literature on Cancer in Relation to Occupation—Cancer in the Patent-fuel Industry—Pitch Ulceration and Paraffin Cancer—Occupational Incidence—Alcoholism—Prisons and Asylums—Petroleum Industry—Malignant Disease of the Lungs in Miners—Gardening and Agriculture—Cancer among Paraffin-workers—Brewers—Furriers and Skinners—Seamen—Tin-plate-workers—Lead-workers—Rubber-workers—Chemical-workers—X-ray Workers—Cancer and Exposure to Light—Cancer in the Synthetic-dye Industry—Occupational Mortality Statistics—Life Insurance Experience—Foreign Statistical Investigations—Requirements of Scientific Statistical Research.

CHAPTER V

Cancer as a Problem in Life Insurance Medicine 77

Cancer in the Literature of Life Insurance Medicine—Early Life Insurance Experience Data—Discussion of Scottish Widows' Fund Experience—Observations Regarding Cancer Increase—Experience of American Life Insur-

PAGE

ance Companies—German and Austrian Insurance Experience—Medico-Actuarial Investigation—Family History—Effect of Build and Conjugal Condition—Cancer of Breast and Generative Organs among Single and Married Women—Experience of The Prudential Insurance Company of America—Cancer as a Life Insurance Problem.

CHAPTER VI

The Geographical Incidence of Cancer Throughout the World.... 104

Problems of Geographical Pathology—Recent International Statistics—Cancer Frequency throughout the World—Distribution of Cancer in the United States—Local Variations in Cancer Occurrence—Mortality from Biliary Calculi and Tumors of the Uterus and Ovaries—Increase in Cancer, by Organs and Parts, and by Age and Sex—Mortality by Season—Statistics of the New York State Pathological Institute—Previous Duration of Malignant Disease—Family History and Heredity—Primary Seat of Growth, Probable Causes, and Personal History—Geographical Pathology of Cancer by Specified Organs and Parts, throughout the World.

CHAPTER VII

The Statistical Data of Cancer Frequency in American States and Cities 126

Limitations of Crude Statistics—Progressive Increase in the Cancer Death Rate—Mortality in Large American Cities—Sources of Errors—Range in Cancer Death Rates—Comparative Mortality Rates by Organs and Parts—Comparative Mortality Rates by Age, Sex and Race—Cancer among Mexicans.

CHAPTER VIII

The Statistical Data of Cancer Frequency in Foreign Countries.. 133

Comparative Cancer Mortality Rates for Europe—Africa—Asia—Australasia—Western Hemisphere—Limitations of International Statistics—Cancer a World-wide Menace—Effect of Latitude and Longitude, and of Size of Cities—Comparative Death Rates of American and European Cities.

CHAPTER IX

Some General Observations and Conclusions on the Cancer Problem 146

Cancer among Primitive Races—Cancer among the Jews—North American Indians—Gypsies—Determinable Factors of Cancer Frequency—Age and Senility—Physical Condition—Growth and Development—Precancerous Lesions—Gastric Ulcers and Gall-stones—Uterine Cancer—Early Diagnosis—Hospital Statistics—Public Institutions—Soldiers' Homes—Surgical Aspects—Problem of Recurrence—Duration of Disease—Degree of Malignancy—Clinical Signs—Anæmia—Prognosis—Heredity—Overnutrition—Metabolic Disorders—Vegetarianism—Diet—Civilization—Theory of Atra Bilis—Biochemical Aspects—Goitre—Thyroid Carcinoma—Obesity—Alcohol—Smoking—Gall-stones and Chronic Irritation—Tuberculosis—Syphilis—Rheumatism—Gout—Diabetes—Appendicitis—Parasitic Theory—Cancer Houses and Villages—Cancer à Deux or Marital Infection—Surgical Infection—Worry—Insanity—Need of Educational Campaign in Methods of Control—Restatement of Conclusions and Results.

CONTENTS

Charts

PAGE

1 International Statistics of Cancer Mortality, 1908-1912...... 224
2 Comparative Cancer Mortality in American and Foreign Cities 226
3 International Cancer Mortality by Organs and Parts........ 228
4 Cancer Mortality by Age and Organs or Parts, 1903-1912, United States Registration Area........................ 230
5 Cancer Mortality by Sex and Age, 1901 and 1911, United States Registration States of 1900............................ 232
6 Comparative Cancer Mortality of Southern Cities, by Race... 234
7 Cancer Mortality of Maryland, by Race................... 236
8 " " United States Registration Area........ 238
9 " " England and Wales................... 240
10 " " Ireland............................ 242
11 " " Holland............................ 244
12 " " Bavaria............................ 246
13 " " Switzerland......................... 248
14 " " Italy.............................. 250
15 " " Japan.............................. 252
16 " " Australia........................... 254
17 " " Uruguay............................ 256
18 " " New York City...................... 258
19 " " London............................. 260
20 " " Prudential Industrial Experience....... 262
21 Cancer Fatality Rate, The Johns Hopkins Hospital........... 264

Appendices

A Tumor Classifications..................................... 267
B Cancer Records, Inquiry Blanks and Forms................. 284
C Mortality from Cancer in Different Occupations............. 305
D Cancer Mortality Statistics of Life Insurance Companies....... 316
E International Cancer Mortality by Latitude, Size of Cities and Specified Organs and Parts............................ 402
F Part I—Cancer Statistics of the United States Reg. Area.... 418
Part II—Cancer Statistics, States and Cities of United States.. 450
G Cancer Statistics of Foreign Countries.................... 582
H Recommendations and Instructions on the Control of Cancer 776
Bibliography... 787
Index of Authors... 807
Index of Subjects... 811

A STATISTICAL SURVEY OF THE MORTALITY FROM CANCER THROUGHOUT THE WORLD

CHAPTER I

THE STATISTICAL METHOD IN MEDICINE

Sources of Statistics—Principles of Analysis—Terminology—Difficulties of Diagnosis—Early History—Past and Present Methods of Classification—Natural History of Cancer—Standardized Death Rates—Function of Age and Senility—Ethnic Factors—Question of Cancer Increase—Death Certification and Classification.

Within the vast range of collective phenomena there are few more interesting subjects for statistical analysis than cancer, or what is, perhaps, more appropriately termed the science of *oncology*, which comprehends tumors of all kinds, whether malignant or benign or ill-defined. The mortality from tumors has at all times attracted considerable attention, and even some of the earliest contributions to the scientific study of cancer include statistical observations derived from general mortality or hospital records. If the mortality from cancer were a constant quantity, it would be a foregone conclusion that the ascertainment of the underlying causes or conditioning circumstances of cancer frequency would defy analysis. Since the cancer death rate throughout the world is subject to a very considerable variation, it is equally obvious that the underlying causes or conditioning circumstances must vary to an equal degree, and therefore come within the range at first of scientific conjecture and at last of scientific conclusiveness. It is for these reasons that the statistical method in medicine has been of such exceptionally practical value when applied with skill and impartiality to the study of questions unusually involved because of the innumerable factors underlying observed phenomena more or less indefinitely termed *disease and death*. Statistics is chiefly an auxiliary method in connection with scientific inquiries; but it is none the less necessary to caution the inexperienced against the use of a method or science which on its own account requires as much study and consideration, and as much practical experience, as medicine or surgery or both combined. The liability to error in the correct interpretation of collective phenomena subjected to critical analysis is fully as great as the chances of mistakes in medical or surgical diagnosis. The practical value of the statistical method in medicine, however, is now fully recognized by the foremost authorities on medicine, surgery, biology and public health and the method has the sanction of many years of extensive teaching experience. The use of statistical data in the consideration of medical and sanitary problems has therefore become practically indispensable. The broadening sphere of medicine, which now includes a vast system of public health administration and the medical education of the general public in matters of personal hygiene, more than ever suggests the importance of extreme care and caution in the use of the statistical method, which alone, however, provides the means of arriving

at approximately accurate conclusions regarding the relative degree of frequency of different diseases and the apparent tendency of particular diseases to increase or diminish, in proportion to the population affected.

Difficulties of Statistical Research

The statistical study of cancer involves exceptionally difficult technical considerations, which arise largely out of the complex nature of the cancer problem, biologically, pathologically, medically or surgically considered. The literature of cancer statistics is quite considerable, but largely controversial, and much of it is decidedly superficial and misleading. Statistical fallacies in cancer discussions are so common that the required statistical treatment of the subject has been much impaired in value, with a world-wide loss of confidence in the results. Progress, however, is being made in the direction of a more rational and trustworthy treatment of cancer facts and in the necessarily concise presentation of the data with at least an approach to uniformity, based on standardized methods of original inquiry. The statistical material of cancer mortality for the civilized countries of the world is, however, so enormous that a complete analysis of all the facts is quite impossible. The gradually expanding registration area of the world provides an increasing amount of statistical material, and more qualified consideration is being given to the elementary conditioning factors, such as age, sex, race, etc. For many countries no information regarding the incidence of cancer by organs or parts of the body affected is as yet available; but this defect is also gradually being corrected. The inherent limitations of all cancer mortality data are being better appreciated on the part of the medical profession, government officials and the general public, so that the increasing volume of statistical information is also improving in quality and is therefore becoming more useful in the world-wide quest for the whole truth of the cancer problem.

Sources of Cancer Mortality Statistics

All cancer mortality statistics for the general population are derived from official mortality records or death certificates originally filled out by the attending physician or some person assumed to be familiar with the facts as regards the cause of death.* In the absence of compulsory medical attendance it is obvious that such records must vary in accordance with the perfection of death certification, and it is self-evident that the returns for countries in which a medical certificate as regards the cause of death is not required must be of very limited intrinsic value. For most of the civilized countries this requirement is met to a reasonably satisfactory degree, and what has been said by Longstaff with reference to the value of death certification in England applies to most of the other large civilized countries for which the cancer mortality data are available for a period of years. In his "Studies in Statistics," in connection with a critical study of the national system of vital statistics, George B. Longstaff observes

> I am thoroughly convinced of the soundness of that system and the fallacies inherent in all attacks upon it. Moreover, having studied for several years the figures relating to "Alleged Causes of Death," I have been more and more convinced of the value of those

*The sources of cancer mortality statistics are fully discussed in Chapter II.

figures, and I fully believe that they may be taken as, on the whole, a fair approximation to the truth. At the same time it is hardly necessary to say that, like all other statistics, they require care and knowledge in handling. Without doubt the figures relating to alcoholism, venereal diseases, and perhaps insanity, are almost valueless; but that does not prove that those relating to scarlet fever, pneumonia, *or cancer* are equally valueless. Neither does the fact that a large number of certificates are carelessly filled up invalidate the far larger number that are more trustworthy: indeed, these very sources of error are subject to laws, and are more or less constant factors of the whole. When it is possible, as I have elsewhere proved it to be, to find general laws regulating many of the causes of death, and especially mutual relations between these causes, and relations between some of them and various external phenomena, the only possible inference that I can deduce is that the figures dealt with are the expression, more or less accurate, of facts in nature.

This conclusion does not in the least minimize the serious risk of error in the careless or superficial use of the data of mortality statistics, irrespective of the diseases dealt with; for, as pointed out by Longstaff on the same occasion, "there are numerous fallacies to which the classification of deaths according to their alleged causes is liable." And he enumerates particularly the more or less varying proportions of ill-defined deaths, the more or less varying proportions of indefinite causes, the deliberate falsification of returns for personal or family reasons,* and the effect of the progress of medical science, improved diagnosis, etc. All of these reasons notwithstanding, the conclusion appears to be incontrovertible that on the whole the present system of death registration is entitled to confidence and that the results approximately represent the true state of the nation's health.†

Fundamental Principles of Statistical Analysis

The fundamental principle of all statistical inquiries is the law of large numbers. The accuracy of the statistical judgment is in proportion to the mass of the material considered and the thoroughness of the methods of analysis in matters of detail. The law of large numbers is defined in the statement that "in a large number the actual relations are more accurately expressed than in a small number," and hence the probability may be concluded much more safely from a large number of observations. The exceptional cases are obliterated in the large number, which approaches more closely to the truth, and as such requires to be accepted as approximately conclusive.

In conformity to this principle the statistical investigation of cancer should be on as broad a scale as possible, with a due regard, of course, to the quality of the facts as well as to their quantity. For reasons which do not require discussion, the application of mathematical methods to the cancer problem is decidedly less desirable than the use of impartially collected statistical data derived from a large area of observations, extensive in point of time.‡

*This aspect of the cancer problem is of considerable practical importance. I have briefly discussed the subject in an address on "The Accuracy of American Cancer Mortality Statistics," read before the American Public Health Association, Jacksonville, 1914.

†See also in this connection the correspondence between Dr. Bashford and myself in the London *Lancet*, February 7 and April 11, 1914.

‡The principal works of reference in support of this point of view are "Letters on the Theory of Probabilities," N. A. Quetelet, London, 1849; "Essays and Papers on Some Fallacies of Statistics concerning Life and Death, Health and Disease," Henry W. Rumsey, London, 1875; "History, Theory and Technique of Statistics," August Meitzen, Philadelphia, 1891; "Studies in Statistics," Geo. B. Longstaff, London, 1891; and "Essay on Collective Phenomena and the Scientific Value of Statistical Data," E. G. F. Gryzanovski, American Economic Association, 1906. Important references to errors and defects in vital statistics

THE MORTALITY FROM CANCER

Difficulties of Cancer Terminology

Since the term "cancer" does not permit of an absolutely scientific definition, it is obvious that the statistical consideration of the data derived from different, though official, sources can not be made to conform to the most rigid demands of scientific accuracy. The borderland of innocency or malignancy in tumors is large or small according to the skill and experience of the diagnostician.* The accuracy of the diagnosis itself is affected by the seat of the disease and the necessary opportunities for autopsies and subsequent microscopical research. A scientific definition of the term "tumor" is by all competent authorities admitted to be at present impossible. But it is now less difficult than in former years to exclude small swellings of numerous kinds which can not properly be regarded as within the tumor class. Cancer is unquestionably a fundamental disorder of postnatal growth and development. It has properly been observed by Rudolph Schmidt in his treatise on "Diagnosis of Malignant Tumors of the Abdominal Viscera"† that "in their ultimate causes all processes of growth are traced back to and become merged with the problem of life itself." Regardless of a truly enormous literature, the origin, life history and causation of tumors remain obscure; and until further progress is made in this direction the terminology of oncology must remain unsatisfactory.

In their work on "General Pathology," Pembrey and Ritchie say that "in the case of true tumors the characteristics to be looked on as common to all are, first, that there is a progressive proliferation of cells; and, secondly, that such proliferation does not occur in response to any normal requirement of the tissue from which the tumor springs."‡

The characteristics of malignant tumors, with which the present discussion is almost exclusively concerned, although some attention will be given to tumors of the non-malignant type, are briefly defined by these authors as

> First, generally speaking, their growth is much more rapid, and, secondly, in addition to the original focus, secondary foci tend to appear in other parts of the body. In addition to this, a third outstanding feature of the malignant tumor is the fact that at the peripheral parts there is almost invariably an infiltration of the surrounding parts with extensive, fine, frequently microscopic prolongations, which make it impossible to mark off by any palpable characteristic the growth from the tissues in which it lies.§

*"It has long been held that some benign growths are peculiarly liable to undergo transformation into cancer. This view is held, among others, by Sir James Paget, Sir Jonathan Hutchinson, and Dr. Max Borst. The innocent tumors which are regarded as most likely to undergo this change are sebaceous adenomata, moles, warts, and adenomata in general, but no innocent tumor seems to be more likely to undergo cancer degeneration than the multiple polypoid adenoma of the rectum." ("The Disorders of Post-Natal Growth and Development," Hastings Gilford, London, 1911.)

†"Diagnosis of the Malignant Tumors of the Abdominal Viscera," by Rudolph Schmidt; English translation by Joseph Burke, New York, 1913.

‡"Text-book of General Pathology," edited by Pembrey and Ritchie, London, New York, 1913, p. 224.

§"Text-book of General Pathology," edited by Pembrey and Ritchie, London, New York, 1913, p. 227.

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are the following: "A Study of Three Thousand Autopsies," Richard C. Cabot, *Journal of the American Medical Association*, December 28, 1912; "Past and Present of the Autopsy in Medical Education and Practice," H. Oertel, *Journal of the American Medical Association*, June 7, 1913; "Statistics of Post-mortems in Large Hospitals in the United States and Abroad," E. H. Levinski Corbin, *Journal of the American Medical Association*, June 7, 1913; "Gleanings from Calcutta Post-mortem Records," Leonard Rogers, *India Medical Gazette*, 1908-14; "Some Diagnostic Failures," H. B. Shaw, *British Medical Journal*, April 18, 1914; "An Experiment in the Compilation of Mortality Statistics," Louis Dublin, Quarterly Publication American Statistical Association, December, 1914; "Inaccuracies of American Mortality Statistics," H. Oertel, *American Underwriter*, May, 1913; "Betterment of American Mortality Statistics," E. B. Phelps, *American Underwriter*, March, 1914; "Common Errors in Diagnosis," Adolphe Abrahams, M. D., *The Practitioner*, London, March, 1915.

Difficulties of Cancer Diagnosis

The practical difficulties of accurate diagnosis and uniform tumor classification are best illustrated in the elaborate discussion of swellings in the "Index of Differential Diagnosis," edited by Herbert French, M. D., and others, New York, 1913. Even the most experienced physician and surgeon must at times be seriously in doubt as to the true nature of the cancerous processes first indicated by swellings which may be quite similar, at least in their outward appearance, to an abnormal growth of a non-malignant type. Fibro-adenoma of the breast, for illustration, is a comparatively common form of benign tumor; but there are many pathological varieties, including some containing cysts and intro-cystic growths, which may or may not warrant being properly classified as malignant. Tumors of the abdominal viscera, which account for so large a proportion of the mortality from tumors of all forms, are accurately diagnosed only with considerable difficulty, particularly in the initial stages of the disease. Mechanical aids, such as the chemical evidence of blood in the feces or the determination of vegetable and bacterial organism in the gastro-intestinal tract, have not been found of much practical value, and this has been true also of radiological examinations, the ultimate diagnosis being in most cases the sum total of clinical findings by different and often widely varying methods.

Cancer an Ancient Disease

Malignant tumors, however, diagnosed with difficulty or classified with uncertainty, are among the oldest known afflictions of civilized mankind. The history of cancer can be traced backwards by an unbroken record to early Greece, and even to still more ancient India and Egypt, although the more remote the records, the more obscure, naturally, the description of the initial symptoms and pathological manifestations of the disease. Unquestionably Hippocrates was fairly well acquainted with cancer of the breast, and he recognized the occurrence of malignant disease in certain of the internal organs as well. According to Woglom, in his brief historical review of malignant disease in the "Studies in Cancer and Allied Subjects," published by the George Crocker Special Research Fund, previous to the time of the Roman physician Celsus, the term "carcinoma" included the most bizarre collection of swellings, distinguishing cancer from carcinoma, but including under the former heading many lesions which are now recognized as simply inflammatory. Cancer was well known to Galen, one of the ancient founders of medicine, and surgical operations on account of cancer were practised by Leonidis (about 180 B. C.), who was the first to appreciate the importance of the retraction of the nipple as a diagnostic sign in cancer of the breast. A review of the literature of cancer during the long intervening period of time, which practically coincides with the recorded history of mankind, would needlessly enlarge the present discussion, which has been made to include these brief medical observations for the sole purpose of emphasizing the subsequent conclusion that, regardless of inherent defects in death certification, the available cancer mortality returns may, on the whole, be accepted with confidence as representing with at least approximate accuracy the true local incidence of the disease and its varying

degree of frequency within the modern period of official death registration. The history of cancer from the earliest times to the present day has been admirably brought together in a work of truly colossal magnitude by Prof. Dr. Jacob Wolff, under the auspices of the German Society for Cancer Research.* Wolff gives emphasis to the historical changes in the point of view regarding the causation, pathology and treatment of cancer, from the overthrow of Galen's theories during the sixteenth and seventeenth centuries to the far-reaching discoveries of Virchow, in 1853, and the theory of Cohnheim, in 1867, which underlie modern conceptions of tumor pathology.

Place of Cancer in the Progress of Medicine

Oncology as an exact science on the foundations of Virchow's cellular pathology is of comparatively recent date. Yet it is probably true that more is now known regarding the physiology and pathology of tumors than concerning any other disease, with the possible exception of tuberculosis. The remarkable progress in exact tumor diagnosis during recent years is largely due to the development of microscopical science and the highly specialized efforts in modern laboratory research. Previous to the advent of biological science, much of the prevailing medical opinion regarding tumor pathology was mere guesswork, and often seriously erroneous. At the same time even a brief review of the medical literature of the last one hundred and fifty years or more, conclusively proves the soundness of prevailing general conceptions regarding cancerous processes and the practical certainty that at least as regards terminal diagnosis the majority of malignant tumors were accurately diagnosed as such and correctly classified in conformity to prevailing systems of nosology. For illustration, the observations of Samuel Sharp on encysted tumors and on the amputation of the "cancer'd" and scirrhous breast, published in his treatise on "The Operations of Surgery," issued in a seventh edition, London, 1758, include the following interesting and useful remarks:

> The Success of this Operation is exceedingly precarious, from the great Disposition there is in the Constitution after an Amputation, to form a new Cancer in the Wound, or some other Part of the Body. When a Schirrus has admitted of a long Delay before the Operation, the Patient seems to have a better Prospect of Cure without danger of a Relapse, than when it has increased very fast, and with acute Pain. I cannot however be quite positive in this Judgment, but upon looking around amongst those I know who have recovered, find the Observation so far well-grounded. There are some Surgeons, so disheartened by the Ill-success of this Operation, that they decry it in every Case, and even recommend certain Death to their Patients, rather than a Trial, upon the Supposition it never relieves; but the instances, where Life and Health have been preserved by it, are sufficiently numerous to warrant the Recommendation of it.

Ulcers and Cancerous Complaints

Bell's treatise on "Ulcer," published in 1784, and Pearson's "Observations on Cancerous Complaints," published in 1793, make now rather curious reading, in contrast with the more systematic and scientific discourse on the "Anatomy, Physiology, Pathology and Treatment of Cancer," by Walter Hayle Walshe, published with additions by Dr. J. Mason Warren, of Boston, in 1844; just as the work of Walshe is in marked

*"Die Lehre von der Krebskrankheit von den ältesten Zeiten bis zur Gegenwart," (in three volumes) by Dr. Jacob Wolff, Jena, 1907, 1911 and 1913.

contrast with the recent work on the "Pathology of Growth, with Special Reference to Tumors," by Charles Powell White, or the treatise on "Cancer of the Breast, with Special Reference to Operations and Their Results," by Charles B. Lockwood, London, 1913.

Classification of Cancers by Walshe (1844)

In the absence of a concise definition of the term *cancer* or *malignant disease*, an exact classification of tumors is obviously impossible. Numerous attempts have been made to classify tumors according to fundamental concepts derived from the sciences of anatomy, physiology and pathology, but all of these classifications vary more or less in essential matters of detail. An early classification of cancer, published in the work by Walshe in 1844, is of present interest as an aid in the interpretation of the cancer mortality statistics of a period which practically coincides with the beginnings of modern death registration. The classification by Walshe* is given in Table 1, Appendix A.

In commenting upon this classification the author points out that cancer as a morbid product is unequivocally separated from others belonging to the same class, as, for example, *pus* and *tubercles*. He also differentiated malignant tumors from those analogous thereto, such as fatty, fibrous and cartilaginous tumors. According to Walshe, the genus carcinoma includes three species, Encephaloid, Scirrhus and Colloid; but the term is meant to be equally applicable to all of these in every stage of their existence, before as well as after softening and ulceration. The practical difficulties of an exact classification† are emphasized in the statement that

> Each species presents a certain number of varieties. In a column apart are collected the chief synonyms, under which the species have been described by different writers. The comprehension of the work of these authors will, we trust, be facilitated by reference to this list; and the dismay naturally felt by the student on encountering in each new treatise one or more names of diseased formations seemingly distinct from all those he had previously become acquainted with, will be in some measure removed, when he discovers that such diversity of *names* by no means implies a corresponding multiplicity of *things*.

Some of the terms contained in the Walshe classification are now obsolete and meaningless. The classification, however, emphasizes the painstaking care with which the subject was considered at a time when, according to the available mortality records, all forms of cancer combined, as well as non-malignant tumors, were much less frequent than they are to-day. The tumor death rate of Boston for 1840-44 was only 25.9 per 100,000 of population, which by 1909-13 had increased to 109.6. The relative frequency of cancer at different periods of time was discussed by Walshe, with special reference to early English mortality data, and the same question was then raised as now: whether the observed increase in the cancer death rate was real or only apparent and due to more perfect registration and increased accuracy in diagnosis.‡

*"The Anatomy, Physiology, Pathology, and Treatment of Cancer," by Walter Hayle Walshe, M. D., with additions by J. Mason Warren, M. D., Boston, 1844, p. 6.

†See Table 1, Appendix A.

‡"The Anatomy, Physiology, Pathology, and Treatment of Cancer," by Walter Hayle Walshe, M. D., with additions by J. Mason Warren, M. D., Boston, 1844, pp. 127-129. See also a paper by Le Conte on "Statistical Researches on Cancer," *Southern Medical and Surgical Journal*, May, 1846, Vol. ii, No. 5.

Classification by Delafield (1871)

In 1871 Francis Delafield, M. D., who was then the Curator of Bellevue Hospital, published a new grouping of morbid growths, from which the colloids* included by Walshe were omitted. The classification was as follows:

Malignant	Encephaloid Scirrhus
Semi-malignant	Epithelioma Myoma Enchondroma
Benign	Glandular tumors, etc., tubercle, and some forms of hypertrophy

This classification was based upon the principle that the malignancy of a tumor could be conclusively determined only by microscopical examination and the character of the cells, whether simple or compound. The classification was a substantial advance over earlier attempts of a similar kind. The practical impossibility of exact differentiation between malignant and benign tumors is shown in the table, by the inclusion of a group of semi-malignant growths, some of which according to present theories are strictly within the malignant class. Until the cause or causes of tumor growth are known with absolute certainty, the basis for scientific classification is necessarily non-existent. It has properly been pointed out in this connection in the "Text-book of General Pathology," by Pembrey and Ritchie, that

> The purpose of any attempt at classification can only be to divide tumors into groups for convenience of reference. All tumors consist of cells whose appearance and qualities can usually be related to those of some normal tissue. Their outstanding feature is capacity for multiplication, and this manifestation of activity, again, usually reproduces more or less closely the features of the normal development of the normal cells from which they spring. Taking advantage of this principle, it is common to found provisional classifications on the differential characters assumed early in embryonic life by the cells from which the body is built up. The rationale of such a procedure is that, once the characters of the differentiation are assumed, they tend to be perpetuated whatever change may occur in the destiny of the dividing cell. Certain exceptions to this rule will demand consideration later. Some such simple classification as is given in the accompanying table suffices for the practical requirements of the working pathologist.†

Classification by Pembrey and Ritchie (1913)

The classification referred to is given in full in Table 2, Appendix A. The authors of the classification frankly concede that the same is not based on strictly scientific principles, but, rather, on general usage, and they concede it to be "still extremely unsatisfactory." They point out that a large variety of names are employed, the significance of which can only be learned by long experience. In a general way these names indicate the tissue from which the tumor develops, the terminology being effected by the addition of the Greek affix *-oma* to the root of the term descriptive of the tissue. They add, however, to their classification the following brief and exceptionally useful explanation:

> A *papilloma* is a simple tumor of epithelial origin, and the term *epithelioma* is reserved

*The word *colloid* means glue-like and a colloid cancer is a carcinoma with colloid degeneration. A colloid cyst is a cyst with jelly-like contents.

†"Text-book of General Pathology," edited by Pembrey and Ritchie, London, New York, 1913, pp. 232-233.

for malignant tumors springing from skin surfaces. The terms applied to innocent tumors springing from connective tissues constitute a large group—a *fibroma* being such a tumor composed of fibrous tissue, a *myoma* of muscular tissue, a *myxoma* of mucoid tissue, a *lipoma* of fat, a *chondroma* of cartilaginous tissue, an *osteoma* of bone tissue. Malignant tumors springing from the same types of tissue are referred to as *sarcomata*. When sarcomata spring from special connective-tissue structures, there is prefixed to the word a term indicating the special tissue, e. g., *myxo-sarcoma, chondro-sarcoma, osteo-sarcoma*. A simple tumor springing from a gland is usually referred to as an *adenoma*; but the term malignant adenoma is often used to designate cylindrical-celled tumors of the intestine. The greatest confusion centers round the use of the word *carcinoma*. This term—the scientific transliteration of the popular word "cancer"—essentially connotes the infiltrative capacity of a malignant growth, and has often been applied to any tumor presenting this feature. According to present clinical convention, however, it is antithetical to sarcoma, and this indicates malignant tumors of epiblastic or hypoblastic origin, the variety present in any individual case being specified by adding the name of the organ in which it occurs.

Classification by Hatch (1904)

The problem of tumor classification has been discussed by so many writers on cancer and allied subjects that it would be quite impracticable to review the various efforts and their advantages or defects on this occasion. In an admirable address on "Cancer: Its Origin and Successful Treatment," by Dr. J. Leffingwell Hatch, a classification of tumors was presented according to the five pathological blastodermic regions of the body, and in view of its practical utility the same is reproduced in full in Table 3, Appendix A. This and other classifications require only to be brought forward to emphasize the serious technical difficulties confronting the statistician in an effort to deal with the cancer mortality problem in strict conformity to the principles which underlie the study of all collective phenomena or the science of averages as fundamentally conditioned by the law of large numbers. It is primarily for the purpose of illustrating the practical difficulties of the cancer problem from the medical point of view that the foregoing considerations have been taken into account in what is intended to be a strictly statistical study of a subject, which nevertheless is at root a problem of the first order of importance in biology, physiology, pathology and therapeutics.

Classification by Delafield and Prudden (1913)

In the Ninth Edition of the "Text-Book of Pathology," by Delafield and Prudden, it is pointed out that it is not possible to-day "to make a satisfactory scientific classification of tumors; but the fact that they are composed of structures which resemble the various morphological types of tissue found in the normal body suggests a grouping of the various forms which may be regarded as a useful and suggestive catalogue." The classification suggested by these two distinguished authors is as follows:*

* "The attempt has often been made to classify tumors with reference to the developmental history of the tissues represented, and it has been generally believed that cells once differentiated in the primary embryonic layers cannot again be merged in type. While this principle holds good in general, especially for highly differentiated forms, certain recent studies have seemed to indicate that even this distinction may not be inflexible. However this may be, it is certain that the cells derived from one embryonic layer may under special conditions come so closely to resemble in morphology those of another layer that a structural differentiation, with our present resources at least, is not always possible. While, therefore, this, which is called the *histogenetic principle of classification*, is most suggestive and may be useful in connection with other data in the study of tumors, it seems to the writer that it is wiser for the present not to base our classification too largely upon embryological data in several particulars still subject to controversy." (Delafield and Prudden, "Text-Book of Pathology," pp.357-358.)

CLASSIFICATION OF TUMORS

(Delafield and Prudden)

Connective-tissue Type

Normal Tissue	Tumors
Fibrillar connective tissue	Fibroma
Mucous tissue	Myxoma
Embryonal connective tissue	Sarcoma
Endothelial cells	Endothelioma
Fat tissue	Lipoma
Cartilage	Chondroma
Bone	Osteoma
Neuroglia	Glioma

Muscle-tissue Type—Myomata

Normal Tissue	Tumors
Smooth muscle tissue	Leiomyoma
Striated muscle tissue	Rhabdomyoma

Nerve-tissue Type—Neuromata

Vascular-tissue Type—Angiomata

Normal Tissue	Tumors
Blood-vessels	Angioma
Lymph-vessels	Lymph-angioma

Epithelial-tissue Type

Normal Tissue	Tumors
Glands	Adenoma
Various forms of epithelial cells and associated tissues	Carcinoma

Classification by White (1914)

The most recent tumor classification occurs in a treatiseon "Tumors," by Charles Powell White, whose definition of a tumor is that of "a mass of cells, tissues or organs resembling those normally present in the body but arranged atypically, which grows at the expense of the body, without subserving any useful purpose therein." The classification of tumors adopted by White is based on the three different orders of units of organization, that is, organs, tissues and cells. The classification is given in full in Table 4, Appendix A. The explanation of the classification is unusually lucid and is followed by an extended discussion of the different types of tumors, both malignant and benign. As regards the nomenclature adopted, the author observes that

> The organomata are called teratomata from their resemblance to monsters. The histiomata are named from the tissue which forms the characteristic feature of their structure with the addition of the termination *oma*. This, however, is not the case with the epithelial and endothelial histiomata because the terms "epithelioma" and "endothelioma" are sometimes applied to certain forms of cytomata. The cytomata are properly named from the cells which form their characteristic elements. Epithelial cytomata are, however, called by the old Greek name carcinoma from the supposed resemblance of these tumors to a crab (Latin, cancer). Supporting tissue cell tumors (desmocytomata) are named sarcomata. Collectively the cytomata are called cancers. Compound tumors are named by compound words representing the various constituents of the tumors: hence myxofibroma, osteofibroma, chondrosarcoma, etc.

The classification by White is likely to prove exceptionally useful for practical purposes; but he properly directs attention to the fact that

nediate and compound tumors exist which may not admit of a e classification. In view of the importance of the carcinomata, uthor's subclassification according to the type of epithelial cell ich the tumors are composed is given below:

Subclassification of Carcinomata	1	Squamous-celled carcinoma
	2	Columnar-celled carcinoma
	3	Spheroidal-celled carcinoma
	4	Syncytial carcinoma or syncytioma
	5	Endothelial cytoma or endothelioma

ould be difficult to give extended consideration to these principles sification in the analysis of cancer mortality data. It would require case of each and every tumor terminating fatally that a qualified scopical examination be made of the growth to determine with ite accuracy its precise nature, which, aside from the impos- y of securing the consent of interested parties to an autopsy, prove prohibitive as a matter of expense. The classification, 'er, is exceedingly interesting and valuable for scientific purposes, would seem to permit of being adopted, at least, by surgeons and hospitals, with facilities for microscopical research.*

The Natural History of Cancer

: essential elements of the cancer problem have been discussed with :ional thoroughness in the "Natural History of Cancer, with Spe- eference to Its Causation and Prevention," by W. Roger Williams, This work includes extended observations on the geographical bution and incidence of cancer, the observed increase in the disease, ifluence of age, sex, personal history, family history, etc., and, ', some exceptionally useful observations on quasi-malignant o-plasms and the difficulties experienced in the exact diagnosis of 's and their various causes. The considerable use of statistical data discussion of the geographical distribution of cancer as well as its 'aphical distribution throughout the United Kingdom forcibly illus- the practical importance of the statistical method and the possi- s of an increase in usefulness by more trustworthy data derived official reports on death registration, the reports of hospitals and l institutions for the treatment of cancer, and last, but not least, tended experience of life insurance companies. The essential ical elements of the cancer problem are, in the order of their 'e importance, age, sex, race, occupation, locality and family y. Each of these elements requires to be separately considered, due regard to the varieties of cancer and the organs and parts of ody affected. Among other important factors are conjugal or l condition, religious belief, density of population and special ntial conditions, topography, soil, climate, habits and personal r of past diseases, including, of course, traumatisms of every When it is conceded that all of these factors more or less influ-

nor classification according to the histologic constituents, physical manifestations and seats of pre- by Gould and Pyle, as contained in the second edition of the Pocket Cyclopedia of Medicine and given in Table 5, Appendix A, for convenient reference.

ence the local incidence of cancer, it is self-evident that the statistical correlation must become extremely complex, according to the methods of analysis employed. Excepting, however, the age and sex factors, it would appear that thus far no other special conditioning circumstances affecting cancer frequency in human beings have been shown to be of sufficient local importance to invalidate general conclusions based on crude cancer death rates, not standardized for sex and for age. *It would obviously be an unpardonable statistical error to compare without at least a word of caution the crude cancer death rates of long-settled countries, including a considerable proportion of aged persons, with the crude rate of a new country consisting chiefly of immigrants and their offspring, largely of the non-cancerous period of life.* As a rule, however, in the absence of such a standardization for age, the crude cancer death rates are a sufficiently accurate index of local cancer frequency in the case of countries free from abnormal population conditions, such, for illustration, as are found in the excessive proportion of aged persons in a country like Ireland and the abnormally low proportion of old people found in recently settled countries or localities, as typified in the case of Australia.* The same conclusion applies to countries or localities with an abnormal sex distribution, as best shown in the case of new settlements for lumbering or mining purposes, where the population consists almost exclusively of men. The two fundamental factors which invariably condition the local cancer death rate are, first, the varying sex and, second, the varying age distribution of the population. For the large majority of civilized countries the cancer death rates are available by sex, but it is possible for only a relatively small proportion of countries and localities to calculate the required cancer death rates by sex and divisional periods of life.

Standardized Cancer Death Rates

The importance of these observations is concisely brought out by the following facts derived from the last annual report (1913) on the mortality of the registration area of the United States. The total number of deaths from cancer was 49,928, and of this number 20,045 were deaths of males and 29,883 were deaths of females. Since the sex proportion of the population in the registration area is almost the same, the relative cancer death rates, according to sex, differed in the proportion of 10 to 16, as determined by a male cancer death rate of 61.3 and a female cancer death rate of 97.6 per 100,000 of population for the year 1913. Since the registration area includes only about 65 per cent. of the total population, it is a safe assumption that the approximate number of deaths from cancer in the Continental United States for the year 1915 may be conservatively estimated at 80,000, and of this number 32,100 would be deaths of males and 47,900 would be deaths of females. It is therefore self-evident that in the calculation of cancer death rates, as far as practicable, the sex factor requires to be taken into account.

Cancer is so peculiarly a function of age, that for the purpose of precise calculation the various populations considered require to be reduced to a standard or uniform distribution, resulting in what is technically

*According to recent census returns the proportion of persons aged 65 and over was 10.0 per cent. for Ireland, against only 4.3 per cent. for the Australian Commonwealth.

known as "corrected" death rates. A more strictly scientific term would be "standardized" death rates. The importance of the age factor in cancer mortality is illustrated in the simple statement that in the United States registration area during the year 1913 out of 49,887 deaths from cancer at all known ages, 42,173 deaths, or 84.5 per cent., occurred at ages 45 and over. In the Ordinary experience of The Prudential Insurance Company of America, 1886-1913, the proportionate* mortality from cancer at ages 45 and over was 8.5 per cent. for males and 17.8 per cent. for females. Among insured females in the Company's Ordinary experience at ages 45 and over, cancer was the leading cause of death. In most of the civilized countries of the world the female cancer death rate exceeds the male cancer death rate, but there are some important exceptions to this rule which demand special consideration. In England and Wales, in the year 1911, the crude cancer death rate of males was 89.1 per 100,000 of population, whereas the female cancer death rate was 108.8, a difference of 19.7 per 100,000 of population. The standardized rates according to sex, that is, corrected for variations in the age constitution of the two populations, were 82.3 for males and 99.8 for females, a difference of 17.5 per 100,000 of population. These differences, it will be granted, are not of sufficient importance to invalidate the general conclusion that the male cancer death rate of England and Wales is normally below the cancer death rate of females. A much more pronounced difference, however, in the cancer death rates according to sex is disclosed when the rates for rural districts are compared on the basis of the necessary standardization for age and sex. According to the report of the Registrar-General for 1911, the crude cancer death rate of males living in rural districts was 90.5, which was reduced to 68.9 when corrected for age on a standardized basis, or a difference of 21.6 per 100,000 of population. The cancer death rate for females was changed from a crude rate of 113.4 to a standardized rate of 90.8, or a difference of only 12.6 per 100,000 of population. This result is accounted for by the large proportion of aged women in the English rural population, so that as a general rule the rural cancer death rates of the two sexes are more urgently in need of standardization for age and sex than the crude rates of cities.†

Cancer a Function of Age and Senility

The age factor in cancer is unquestionably a disturbing one in general mortality statistics. The frequently expressed opinion, however, that the increase in the average duration of life during recent years is a sufficient explanation of the apparent increase in the cancer death rate is seriously misleading. The argument that "those who to-day live long enough to be attacked by cancer would in the majority of cases, had they lived in years gone by, have succumbed earlier to small-pox, consumption and other scourges, which have since been so greatly reduced in frequency," is equally erroneous. Cancer death rates, when

*The term proportionate mortality means the number of deaths from cancer in every 100 deaths from all causes at the divisional period of life specified. Additional details regarding the Company's cancer mortality experience are given in Tables 1 to 27, Appendix D.

†The official statistics of cancer for England and Wales are contained in the annual reports of the Registrar-General of Births, Deaths and Marriages. Special consideration has been given to cancer in recent reports, particularly the 74th, 75th and 76th, for 1911, 1912 and 1913.

calculated for divisional periods of life, measure the rate of mortality at those particular periods and without reference to any other. If it can be shown that the cancer death rate at ages 45 and over is higher to-day than in former years, the higher rate is evidence of a true increase in cancer liability among equal numbers affected and is not the result of a mere shifting in disease liability of equal degree from one group of causes to another. From a physiological point of view, the age factor in cancer is the equivalent of the observed retrogression of cells to an extremely primitive form, typical of true senility, or old age. As observed, however, by Sir Jonathan Hutchinson: "Sometimes it is not so much senility of the entire organism, as what we may term *local senility* and old age of the tissues concerned, which is primitive and does not correspond to that of the body as a whole." "Nor indeed," he continues, "is it correct to say that the degree of senility is the measure of proneness to cancer, for it is not in conditions of advanced senile atrophy that cancer is most apt to occur, but, rather, in its commencement. Tissues and organs which are just commencing to decline are those which are most prone to develop it." That cancer processes are, in fact, evidences of a senile change seems to be well established by the researches of Hastings Gilford and others, whose conclusions are in conformity to the theory advanced many years ago by Sir James Paget regarding errors in the chronometry of life. In the words of this distinguished authority: "The local defects of working power require more often to be thought of in the time rate of life in the defective parts and we should think of the age of each part as not always wholly or exactly expressed by the time that has elapsed since it was first formed."*

A reference to these observations seems pertinent as a precaution against the prevailing view that cancer is a specific function of age, instead of its being more accurately a function of senility, which as a rule by some years precedes normal old age. In fact, as observed by W. R. Williams, "centenarians and other very aged persons are shown to be little prone to malignant tumors." In contrast, it is well known that tumors occurring in early life are much more rapidly fatal than those which occur later in life. Since tumors in youth are as a rule of the sarcoma type, that is, cancers of connective-tissue formation, it is sincerely to be regretted that in most of the available cancer statistics the required distinction of carcinoma and sarcoma should not have been made, with a due regard to age and sex. The importance of such a distinction has been clearly brought out by Bashford in one of his papers on the age incidence in cancer mortality.†

The Factor of Race in Cancer Mortality

The race factor in cancer mortality statistics is also of considerable importance, and the cancer death rates for countries with a population consisting of widely different ethnic elements require to be corrected

*See in this connection an interesting editorial in the *New York Medical Record*, May 31, 1902, on Errors in the Chronometry of Life, with special reference to the observations and conclusions of the late Sir James Paget.

†Scientific Reports on the Investigations of the Imperial Cancer Research Fund, Part I, Statistical Investigation of Cancer, London, 1905. See also in this connection the tables on cancer and sarcoma, by single years of life, derived from the Industrial experience of The Prudential Insurance Company of America, in the Appendix to the chapter on Cancer as a Problem in Life Insurance Medicine.

or given in detail on this ground. As a typical illustration the Island of Ceylon may be referred to, where the population consists of such widely different ethnic types as Europeans, Sinhalese and Tamils.* According to the hospital returns of Ceylon for 1913, out of 88,724 admissions for all causes, only 217, or 0.24 per cent., were on account of malignant growths, and 287, or 0.32 per cent., on account of non-malignant growths. Of the 217 admissions for malignant growths, 45, or 20.7 per cent., terminated fatally, whereas out of 287 admissions for non-malignant growths, 7, or 2.4 per cent., terminated in death. Another illustration is the District of Columbia, where of the total population in 1910, 28.5 per cent. were of African descent. All of the available evidence is to the effect that the recorded cancer death rate of primitive races is materially below the average for civilized countries. The argument frequently advanced that this difference is much more apparent than real is hardly applicable to the conditions under which the available information for native races has been obtained. Qualified European physicians practising for years among the native Egyptians, the primitive races of East and West Africa and the North American Indians are in entire agreement that malignant tumors of every variety are quite rare among the uncivilized or semi-civilized types of mankind. The evidence regarding the infrequency of cancer among native races has been carefully examined and admirably set forth in "The Natural History of Cancer," by W. R. Williams; and equally convincing evidence will subsequently be presented in the statistical portion of this work.

In the United States previous to the Civil War, cancer among the negro population was relatively rare,† and particularly was this observed to be true by plantation physicians as regards cancer of the uterus among negro women. At the present time, under conditions of unrestrained personal freedom, the difference in the cancer mortality of the two races is decidedly less pronounced, though, as a rule, the general cancer death rate of the white population is still considerably in excess of the cancer death rate of the negro. At ages 40 and over, for illustration, the mortality from cancer of the stomach and liver in the District of Columbia for the decade ending with 1910 was 105.5 per 100,000 of population for white males, against 73.1 for colored males, and 84.5 for

*During 1908-12 the cancer death rate of Ceylon by race was as follows: Europeans, 15.9; Burghers, 25.9; Sinhalese, 7.3; Tamils, 5.4; Moors, 6.5; Malays, 3.2; all races combined, 6.8 per 100,000 of population. In a letter, of May 1, 1914, Mr. Bertram Hill, Registrar-General of Ceylon, writes me as follows: "The figures in the Ceylon Vital Statistics as to causes of death must be accepted with caution. In the majority of cases diagnosis is made by persons who have had no medical training or at least no training on modern scientific lines and who probably would not be able to diagnose cancer if they came across it. Then, again, Europeans return to Europe, as a rule, if they are afflicted with any serious disease, and the age constitution of the European population is not favorable to the development of cancer; most European Civil Servants retire at the age of 55 or under and return to England for the rest of their lives. A similar practice exists among planters and merchants. There are then comparatively few Europeans over 55 years of age in Ceylon [7.1%]. It is worthy of note that of the 406 fatal cases of cancer which were recorded in this Island in 1912 no less than 107, or 26 per cent., were due to cancer of the buccal cavity. This is attributed to the habit of chewing betel: the chew consisting of the betel leaf, tobacco, arecanut and lime. This 'quid' is kept constantly in the mouth and no doubt sets up irritation, which results in cancer. Apart, however, from the unreliability of the figures, I believe that *cancer is a comparatively rare disease in Ceylon*, though the rate has risen from 6.5 in 1910 to 9.8 per 100,000 in 1912. It is worthy of note that the cancer mortality in the Straits Settlements (which have a climate closely resembling that of Ceylon) was 9.6 per 100,000 last year."

†See in this connection a discussion of the mortality from tumor among the American negro population in my "Race Traits and Tendencies of the American Negro," New York, 1896.

white females, against 64.5 for colored females. In marked contrast, the mortality from cancer of the generative organs in the District of Columbia was 84.2 per 100,000 of population for white women, against 123.1 for colored women. These illustrations sufficiently emphasize the importance of giving due consideration to the fundamental element of race, aside, of course, from the factors of sex and age.*

Limitations of the Present Inquiry

It is not the present purpose to enlarge upon the numerous factors and circumstances which condition the observed variations in cancer frequency in different countries and at different periods of time. The main object is to facilitate the statistical study of the cancer problem by making available the more important general data for the civilized world, arranged as far as practicable in a uniform manner and reduced to rates calculated by uniform methods. The available amount of statistical information is of astonishing proportions. Most of the original reports containing cancer mortality statistics are unavailable to the student of the subject from the medical and surgical point of view. There is much pretended accuracy in numerous statistical tabulations which, however, are often found wanting, in that widely varying methods of estimating the population have been employed and frequently no correction has been made for changes in population during intercensal periods. Even some of the more pretentious international tables of cancer statistics fail in the matter of accuracy of detail.† It has therefore been necessary for the present purpose to reconsider the entire material, and unless otherwise stated, all of the tables presented are derived from official sources, that is, either from the original official reports on mortality or by means of correspondence with the registration officials in charge. The populations for intercensal periods have as a rule been recalculated, in conformity with the arithmetical method. The rates have been checked at least twice throughout, but, considering the vast amount of material brought together, from so many different sources, absolute accuracy must be assumed unattainable.

The chief purpose of the present investigation, as stated before, is to make the existing statistical data available to the student of the subject, to whom most of the facts would otherwise be inaccessible. A second important object has been to determine the true tendency of the cancer death rate, or, in other words, the rate of increase or decrease in cancer mortality throughout the civilized countries of the world. The controversial aspects of the question as to whether cancer is on the increase or not are separately considered in another portion of this work. A third object of the present inquiry has been to ascertain as far as practicable the relative incidence of cancer according to the organs or

*Proportion of Negro Population, Census 1910: Charleston, S. C., 52.8 per cent., Mobile, Ala., 44.2 per cent. and New Orleans, La., 26.3 per cent.

†The principal sources of international cancer statistics are: Statistique Internationale du Mouvement de la Population d'après les Registres d'État Civil (publiée par le Ministère du Travail et de la Prévoyance Sociale, Paris, 1907 et 1913); Statistique Démographique des grandes Villes du Monde pendant les Années 1880-1909 (publiée par le Bureau Municipal de Statistique d'Amsterdam); Annual Reports of the Registrar-General of Births, Deaths, and Marriages in England and Wales. See also in this connection the discussion on Cancer in the first volume of "Handwörterbuch der sozialen Hygiene," by Grotjahn and Kaup, Leipzig, 1912, and the section on Statistics in the third volume of "Lehre von der Krebskrankheit," by J. Wolff, Jena, 1913.

parts of the body affected, with a due regard to age and sex, in different countries of the world. It is a remarkable fact that for most of the countries the required information is not available. Absolute completeness in the tabular analysis has therefore not been attainable; but every effort has been made to present the more useful data, at least, for the countries with admittedly trustworthy systems of registration, based upon reasonably accurate methods of death certification.

Urgency of Complete Information

The difficulties of statistical research into the cancer problem are needlessly increased by the common neglect on the part of those responsible for the official publications on cancer mortality to provide the necessary information as regards the organs and parts of the body affected. The rather common practice of only assigning cancer as a cause of death, without regard to the organs or parts of the body affected, materially impairs the practical utility of the available information. The conviction, however, is gradually gaining ground that the required details with regard to cancer are as essential as they are with regard to fevers. It would be as logical and as useful to return deaths from fevers without stating whether typhoid, malarial or some other form as it is to return deaths from cancer without stating whether of the stomach or liver, the uterus, the breast, etc. Such details are absolutely indispensable to the more scientific purposes of statistical research into the natural history of malignant disease. It does not involve much additional labor on the part of the attending physician to enter on the death certificate the particulars as regards the organ or part of the body affected by the cancerous growth causing death, but the absence of such information often precludes the highest attainable degree of completeness in the practical use of cancer mortality returns; in its final analysis the question as to whether cancer is on the increase or not reduces itself to the problem as to whether cancer of any particular form or type is more or less prevalent now than in former times. It has probably never been seriously maintained by any one at all familiar with the subject of cancer mortality statistically considered that *all* forms of cancer were on the increase, any more than one would be justified in concluding that because the general death rate is declining the decrease in the rates affects *every* disease or cause of death. It should be perfectly obvious that the general death rate may be decreasing regardless of the fact that the rate is increasing at certain ages or from certain causes; and the general death rate from cancer may be increasing regardless of the fact that there may be a decline in the frequency of malignant disease as affecting certain organs or parts, or certain special elements of the population, particular age groups, etc.*

*The argument has been put forward by the Director of the Imperial Cancer Research Fund that "All the statements widely circulated in the newspapers as to the increase of cancer as a whole should be ignored and attention only paid to those in which cancer affecting the different parts of the body are considered." This conclusion is not justified by the facts, for as a general principle it may safely be asserted that cancer of all important organs and parts of the body is on the increase in most of the localities for which the data are available and that the occasional exceptions to the rule as regards cancer of particular organs or parts of the body which may show a decline are not of equal importance. Of course, the rate of increase for the various organs and parts of the body varies widely, but this does not affect the broad conclusion that malignant disease, considered as a group, shows a decided tendency towards an increase, relatively to the population affected, throughout the civilized world.

The Problem of Cancer Increase

In the classical essay on "The Alleged Increase of Cancer," by Messrs. King and Newsholme, originally read before the Royal Society on May 4, 1893, the statistical study of the material considered was arranged according to external or accessible cancers and internal or inaccessible cancers. The grouping adopted was rather arbitrary and in some respects misleading, as will be subsequently shown in the more extended discussion of the question as to whether cancer is actually on the increase or not. In a corresponding study made by the Imperial Cancer Research Fund three groups of cancerous affections were adopted, accessible, inaccessible and intermediate. It is self-evident that cancer diagnosis must be decidedly more difficult in the case of inaccessible cancers than in the case of those conveniently accessible by means of external examination. The classification, by Bashford, of accessible, inaccessible and intermediate cancers, the terms referring, of course, to the seat of primary growth, is of much practical value, and for this reason the same is given in full in Table 8, Appendix A, together with a note on the original classification adopted by King and Newsholme.

Effect of Better Diagnosis on Cancer Statistics

Improved diagnosis, especially when based upon autopsies followed by the microscopical study of the tissues affected, must necessarily tend to increase the cancer death rate; but there are reasons for believing that this factor of uncertainty in cancer mortality statistics is not of sufficient importance to seriously invalidate the practical utility of the general cancer death rate. For even in the case of autopsies, mistakes in diagnosis, as conclusively shown by Dr. Bashford, are not entirely avoidable. The margin of error is probably not, however, as wide in cancer death certification as is frequently assumed to be the case. The liability to error is perhaps as great, if not greater, in the classification of cancer mortality returns reported originally in conformity to a more or less indefinite medical terminology. As previously shown the earlier classifications of tumors, whether malignant or benign, indicate that the tendency to classify benign tumors as malignant was probably greater than the liability in modern medical practice to erroneously diagnose malignant growths as tumors of an innocent kind. That within recent years there have been further improvements in diagnosis can not be questioned by any one familiar with the progress of medical science in this and other countries. That there have also been improvements in the more scientific classification of diseases must be readily admitted, and more so in view of the increasing use of the International Classification of Causes of Death, which in the case of cancer provides for seven large groups and numerous subdivisions under each.

The Place of Cancer in Death Classification

The term "cancer," for statistical purposes, as explained in the Manual of the International List of Causes of Death, is a general one, and made to include all forms of malignant neoplasms. The list of these, as given in the original classification, is given in full detail for the purpose of convenient reference, in Table 6, Appendix A. It is stated in the Manual that "the location of the cancer, or preferably, as recommended by the

Committee of the American Medical Association, the seat of origin of the cancer, if known, should always be stated." The seven groups adopted for general purposes of classification are: *first*, cancer and other malignant tumors of the buccal cavity, *second*, cancer and other malignant tumors of the stomach and liver, *third*, cancer and other malignant tumors of the peritoneum, intestines and rectum, *fourth*, cancer and other malignant tumors of the female generative organs, *fifth*, cancer and other malignant tumors of the breast, *sixth*, cancer and other malignant tumors of the skin, *seventh*, cancer and other malignant tumors of other organs or of organs not specified. With regard to the last, it is pointed out that "This is a residual title that includes all deaths from cancer that cannot be assigned to the preceding titles, and especially those in which the location or origin of the disease is not stated." It is suggested that "inquiry should be made in such cases and fuller information obtained, if possible."*

In the subsequent discussion of the cancer statistics of the United States registration area by organs and parts of the body, only these seven groups are considered, since the information in detail for the numerous subdivisions is not at present made public by the Division of Vital Statistics of the Census Office. An urgent recommendation has therefore been made to the Director of the Census by the Executive Committee of the American Society for the Control of Cancer that this omission should be made good in the future by the more complete publication of the facts, or, in other words, the publication of cancer mortality returns in full detail, according to the organs or parts of the body affected. It is to be hoped that this suggestion will be carried into effect in the publication of future reports on the mortality statistics of the registration area.†

For the scientific study of the cancer problem it is, however, of the utmost importance that the available statistical information should be published in more detail, and several suggestive illustrations of the feasibility of this method are given in statistical appendices, particularly in Appendix G, for foreign countries. The earlier returns in detail for New York and Philadelphia may also be referred to as decidedly more useful than the abbreviated statistics published at the present time, in conformity, however, to the International Classification of Causes of Death.

Non-Malignant Tumors

The Manual of the International List of Causes of Death classifies other tumors, excepting those of the female generative organs, as a

*See Tables 6 and 7, Appendix A.

†In conformity to this resolution the Director of the Census has given instructions to the Division of Vital Statistics to make hereafter the following subdivisions in the cancer classification:

CANCER AND OTHER MALIGNANT TUMORS OF THE—

39. Buccal cavity	40. Stomach and Liver	41. Peritoneum, intestines and rectum
Lip	Pharynx	Mesentery and peritoneum
Tongue	Œsophagus	Intestines
Mouth	Stomach	Rectum
Jaw	Liver and gall-bladder	Other
Other	Other	
42. Female Generative Organs	45. Other organs: Larynx, Lungs and Pleura, Pancreas, Kidneys and Suprarenals, Prostate, Bladder, Brain, Bones (except jaw), Testes. Other.	
43. Breast		
44. Skin		

separate group, including all forms of non-malignant neoplasms. These are quite numerous and on account of their importance the details are given in full in Table 6, Appendix A, as derived from the official classification of Causes of Death. Non-cancerous uterine tumors are also separately considered in the International Classification and the details of this group are given in Table 7, Appendix A, together with the official list of cysts and other tumors of the ovary, hydatid tumors of the liver, biliary calculi, calculi of the urinary passages and ulcers of the stomach; it being understood, of course, that in all cases the supplementary classification applies only to non-malignant disease, and that the facts having reference thereto are included in this discussion only as a matter of convenience for the more complete study of tumor science comprehended under the term oncology.*

*On the classification of diseases, with special reference to cancer, see Bellevue Hospital Nomenclature of Diseases and Conditions, adopted by the Board of Trustees, 1903, revised edition, 1911; Massachusetts General Hospital Nomenclature, second edition, revised and enlarged, 1914; Statistical Experience Data of Johns Hopkins, Hospital, Baltimore, 1892-1911, F. L. Hoffman, 1913, including observations on the plan and scope of nosography, Bellevue classification of diseases, and a list of references to disease registration and the practical utility of institutional and other mortality records.

CHAPTER II

THE STATISTICAL BASIS OF CANCER RESEARCH

Limitations of Statistical Analysis—Difficulties of Precise Classification—Early Observations on Cancer Statistics—Need of an Exhaustive Study—Uniform Methods of Tabulation and Analysis—Recognition of Cancer—Importance of Microscopical Research.

The sources of statistical information regarding cancer frequency throughout the world are: *first*, the official mortality statistics, *second*, the statistics of institutions for the medical or surgical treatment of cancer patients, *third*, the recorded individual clinical data of physicians and surgeons, *fourth*, the collective experience data of life insurance companies, *fifth*, the results of special cancer censuses, *sixth*, miscellaneous data of public institutions, such as homes for the aged, almshouses, prisons, retreats for inebriates, etc.

Recognized Limitations of Statistical Analysis

Of the world's population, estimated for 1912 at 1,750,000,000, there are more or less trustworthy cancer mortality statistics for a population of about 450,000,000, or 26.0 per cent. of the whole. For this civilized portion of the world, the intrinsic value of the data available varies quite considerably, not only for the different countries as such, but also for the several component parts of the same country, that is, the political divisions or subdivisions as the case may be. The liability to error in the interpretation of cancer statistics is therefore quite serious and *no conclusions advanced in the subsequent discussion are to be accepted without this important qualification.* As is the case, however, in all mortality statistics, there is a well-established tendency on the part of such errors to more or less balance one another; and the observed regularities in cancer occurrence in different countries and different sections of the same country warrant the conviction that the element of error in cancer statistics is apparently not materially greater, if as great, than in the case of other important diseases, such as typhoid fever, appendicitis, diabetes, etc. The initial liability to error in cancer statistics is naturally the ever-present possibility of mistakes in clinical diagnosis. This liability, however, has probably been more clearly recognized in cancerous complaints than in many other diseases of modern life, as brought out in an interesting early treatise on "Diseases Which Have Been Confounded with Cancer, and Also Some Critical Remarks on Some of the Operations Performed in Cancerous Cases," by John Pearson, Surgeon of the Lock Hospital, London, 1793. As observed by this author:

> For as language is not rich enough to furnish words that will perfectly denote all the different shades of colour, though their dissimilitude is obvious when presented to the mind; so there is a species of practical knowledge, composed of simple ideas derived from observation, for which no competent terms have yet been contrived, and which no periphrasis can adequately describe.

Pearson was evidently a careful observer, for he remarks:

> The application of analogical reasoning to diseases, is a very nice and delicate undertaking; it requires much acuteness and sagacity, and lies not within the province of

an ordinary observer. But in practice it is often of more importance to discern wherein complaints differ, than wherein they agree; and that sort of knowledge which might very properly enable a man to found classes, orders, genera and species, would be quite insufficient to conduct him to a rational and successful mode of treatment. While nosologists therefore are debating whether the cancer ought to stand in the class of cachexiae or locales; let us pursue a more interesting object, and endeavor to ascertain by what signs the Cancer may be distinguished from all other diseases.

Present Difficulties of Precise Classification

This question of exact diagnosis, differentiation and classification has not yet been answered to the satisfaction of the medical and surgical profession. Criticisms, therefore, of faulty cancer statistics lie primarily against those who are responsible for errors in diagnosis and mistakes of subsequent classification, and not against those who perform the equally arduous though perhaps mechanically less difficult task of statistical tabulation and analysis.

Even in so modern a work as the "Index of Differential Diagnosis of Main Symptoms," by various writers, edited by Herbert French, M. D., and published in a new edition in 1913, tumors are considered under the general term of "Swellings," because of the practical impossibility of a precise differentiation between tumors of doubtful malignancy and tumors of doubtful innocency, as well as between mere swellings which fall within the characteristic tumor class and those which obviously do not belong there.* The same argument, of course, may be applied to ulcers, which are also quite difficult of precise classification; and reference may be made here to a treatise on "The Management of Ulcers," with a dissertation on white swellings of the joints, including observations on cancerous ulcers and the causes of cancerous disorders, by Benjamin Bell, M. D., published in 1784. An extended review of the early medical literature on cancer fails to reveal the required evidence of serious misconception of the nature of cancerous complaints in different parts of the human body sufficient to discredit the practical utility of the available vital records with reference to this disease or group of diseases.†

It is nearly seventy years ago since the statistical aspects of the cancer problem were first discussed in the United States, in a contribution by John Le Conte, entitled "Statistical Researches on Cancer," published in the *Southern Medical and Surgical Journal* for May, 1846. The data used were the statistics of the Department of the Seine for the eleven years ending with 1840 and the statistics of England and Wales for 1838-39. Le Conte directed attention to the necessity of sound

*In the words of Mitchell Banks, as quoted by Coley, in a discussion of the increase of cancer in a paper read before the Southern Surgical and Gynecological Association, December 14, 1909, "While the diagnosis of cancer is probably made much more frequently now than in former times, it required little skill to make the diagnosis *at the time of the death* of the patient. The diagnosis at such a time was by no means beyond the ability of even the rural practitioner of fifty years ago."

†The following definition of cancer is from "The Physical Dictionary," by Stephen Blancard, M. D., 6th edit., London, 1715:

"*Cancer:* The *Cancer* is a round, livid or blackish Tumor, circumscrib'd with turgid Veins replete with Blood, either with or without Exulceration, arising from black, corrupted stagnant Bile diversify'd many ways. The true *Cancer* is restrained to the Breasts only of Women, and the *Scapulae* of Men. There is a white *Cancer*, which is a certain white Chalky Recrement occupying the inward parts of the Mouth, and the whole Tongue of Infants; and, except deterg'd and cleans'd in time, will exulcerate."

"*Carcinoma, Carcinus, or Cancer*, a Tumour that arises always in the Glands, from saline, sulphureous, sharp, and melancholy thick Humours. It is round, hard, livid, painful, at the beginning as big as a Pea, but afterwards it is surrounded with great swelling *Veins* which resemble the Feet of a Crab, tho' not always."

statistical methods and particularly to the fallacy of determining the rate of cancer frequency in the form of a proportion of the mortality from all causes. Le Conte contributed a subsequent paper on "Vital Statistics Illustrated by the Laws of Mortality from Cancer" to the *Western Lancet*, March, 1872, and the earlier papers, in part, with material additions, were reprinted in a final contribution on "Vital Statistics and the True Coefficient of Mortality Illustrated by Cancer" to the tenth biennial report of the State Board of Health of California, Sacramento, 1888. The fundamental principle that the mortality from cancer is a function of age was clearly recognized by Le Conte, and he was one of the very first to direct attention to its importance in statistical research. The article also draws attention to the fact that

Nearly all of our statistical data appear to indicate that in the case of cancer there has really been a *secular increase* in mortality, both in France and in England and Wales. It would be premature to attempt to express this increment in numbers as a *time-factor* in our formula for the influence of *age* on the mortality from cancerous diseases. The rational discussion of such questions must be postponed until some zealous investigator of vital statistics arises, who has the leisure and the courage to properly analyze the vast accumulation of valuable facts which are entombed in the mortuary registers of the last forty years.

As regards the probable cause of this presumed increase in the mortality from cancer, it is pointed out by Le Conte that it may be proper to remind the reader that

To some extent, the augmentation may be only *apparent;* since it may arise from more careful registration, from improvements in pathology, and from greater accuracy in diagnosis. It is difficult to estimate the influence of these circumstances. But there is another cause of this apparent increase of mortality which is far more *definite*. It is a well established fact, that the *mean duration* of human life has, even within a comparatively short time, been sensibly *increased*, by the rapid advancement of medical science and by a more philosophical application of hygienic and sanitary regulations.

In a footnote to the article a reference is made to one of the earliest papers on the increase in cancer, contributed to the Transactions of the Society of the Alumni of the College of Physicians and Surgeons of the State of New York, 1842. The possible effect on the cancer death rate of improved methods of diagnosis and death certification on the basis of autopsies was clearly recognized by Le Conte, who remarks that

Perhaps the habit of making necroscopic examinations may be more common in the French metropolis than it is in England, and thus a greater number of *internal* cancers may be detected and registered. But it is hardly reasonable to suppose that the disparity growing out of this circumstance would amount to the enormous proportion of 4 to 1. In view of M. Tanchou's idea, that the mortality from cancer is in a *direct ratio* to the intensity of human civilization, it may be, to some extent, consolatory to the inhabitants of England to discover that their more recent mortuary records, from 1860 to 1863, inclusive, indicate a very remarkable *increase* in the death rate from this disease.*

Considering the very limited amount of accurate statistical information available at this period, the general conclusions arrived at by Le Conte are in remarkable conformity to the facts disclosed by subsequent experience. The article is an illuminating contribution to the statistical

*Probably the very earliest cancer mortality statistics are contained in the "Collection of the Yearly Bills of Mortality, 1657-1758," London, 1759. The returns are limited to the city of London. Cancer is specifically enumerated during every year, but the term includes gangrene and fistula. Excluding the years during which plague was epidemic it is found that between 1651-1758 out of 1,980,037 deaths from all causes 5,123, or 0.26 per cent., were from cancer, including gangrene and fistula. The proportion was highest during 1651-64, or 0.34 per cent., and lowest during 1741-58, or 0.20 per cent. (See Table 15d, Appendix G.)

study of cancer and conclusively proves that for some seventy years at least the question of cancer increase has received more or less qualified and critical consideration in the United States.

Observations on English Cancer Statistics

As early as 1866, in a paper contributed to the *Journal of the Royal Statiscal Society* of London, Dr. W. L. Sargant, in an essay on the "Vital Statistics of Birmingham," observed that

Of all the diseases to which a separate column is assigned, the one, I presume, about which there can be the least dispute is cancer. The number of deaths it causes is small, however, being only about 1 per cent. of all deaths; but it is twice as great among females as among males.

The uniformity of the number in different places is remarkable. In the whole of England and Wales, out of 10,000 persons living, 2 males and 4 females die of cancer each year. The same number, 2 males and 4 females, die of it each year in Liverpool, Manchester, Leeds and Wolverhampton. In Birmingham and Sheffield, there are also 2 male deaths, but 5 instead of 4 females; in London, again, there are 2 males, but 6 females; in Bristol there are no less than 4 males and 6 females. Possibly the excess in these towns is caused by the influx to the hospitals of patients from a wider neighborhood.

At a meeting of the British Medical Association lately held in Leamington, there arose a discussion on the question, whether cancer was a local disease, or whether it was a result of an ill condition of the body. If it were a result of ill condition, we should find more of it in an unhealthy place than in other places; more in Liverpool than in the whole of England and Wales. But in fact we find that out of 10,000 persons living, the same number die in Liverpool that die in the whole country.*

Medical progress varies widely in different countries and at different periods of time. New diseases are recognized in some countries far in advance of others, in consequence of better methods of medical education, postgraduate courses, facilities for research, etc.; but there would seem to be no exception to the rule that until about fifty years ago all cancerous complaints, whether external or internal, were considered by the medical and surgical profession as of comparatively rare occurrence. This conclusion is reflected in the general vital statistics of civilized countries previous to about 1880, in the early experience of life insurance companies and in the early medical literature on the subject. During the last fifty years, however, the gradual increase in cancerous complaints has been more and more recognized, and the following is a suggestive extract from a discussion in connection with the accuracy of statistics of the causes of death by Longstaff, a painstaking student of statistical problems, contributed to the *Journal of the Royal Statiscal Society* of London,† in which it is said that

Cancer, in contrast to renal disease, is twice as fatal to women as to men: it is rare in early life, but steadily increases in frequency from the age of 25 upward. Cancer has increased 38 per cent. in males, 24 per cent. in females, the greater increase in males being probably due to the fact that cancer of the stomach and liver, which is commoner in men than women, is much more difficult of diagnosis than cancer of the female breast or of the uterus. Hence improved medical skill affects the returns for it more. The loss of life due to the increased mortality from cancer amounts to 1,187 males and 1,661 females, of which seven-eighths are above the age of 45. A recent writer (H. P. Dunn, F. R. C. S., in *British Medical Journal*, 1883, pp. 708, etc.), said he was convinced that the long-continued and steady increase of cancer was not apparent only, and accounted for by increased accuracy of diagnosis and registration, but was an undoubted fact; the cause is quite unknown, but must probably be sought in some abnormal circumstances of our

* "The Vital Statistics of Birmingham and Seven Other Towns," by Dr. W. L. Sargant, published in the *Journal of the Royal Statistical Society*, London, 1866.

† *Journal of the Royal Statistical Society*, London, 1884.

artificial existence. It should be remembered that very few, if indeed any, recover from this much dreaded disease, and also that it chiefly attacks after the reproductive age is past. From these facts we may draw the consolation that if there are many killed, there are no wounded, and that although the *tendency* to cancer may be handed down to offspring, they are not born enfeebled in consequence of their parents' ailment.

When this was written the number of deaths from cancer, including sarcoma, in England and Wales was 15,198, equivalent to a cancer death rate for the year 1884 of 56.5 per 100,000 of population. For the year 1911 the cancer death rate of England and Wales was 99.3; if, therefore, in 1884, on account of mistaken diagnosis or erroneous classification, the true cancer death rate had been the same as in 1911, 26,725 deaths would have been assigned to other causes instead of being properly assigned to cancer or sarcoma. Considering the then attained degree of medical education and professional efficiency, this would seem incredible.

Modern Improvements in Diagnosis and Classification

At the same time, there can be no question of doubt that improved diagnosis and more scientific methods of classification have contributed towards the observed increase in the cancer death rate of practically every civilized country throughout the world; but it would seem quite impossible, considering the very material rise in the cancer death rate during the last thirty or forty years, that this increase should be only apparent and not real, and chiefly the result of improved methods of diagnosis and classification. If the same argument were applied to many other diseases, even more obscure and difficult of exact diagnosis than at least the external cancers, it would amount to this: that deaths must have actually occurred which are not a matter of official record, in view of the fact that in practically all of the more important countries the mortality from all causes has relatively declined during the last generation.* Since there has been no material increase in the death rate from all causes at ages over 40, and in the case of some important causes even a decline, it is evident that if cancer ranks to-day foremost among the diseases showing an actual rise in the rate, and practically from year to year for more than a generation, this increase can not possibly be exclusively or even largely the result of improved diagnosis or more scientific methods of classification.

Necessity for an Exhaustive Study

Thus far no thoroughly scientific study of cancer statistics has been made with a view to determine the relevancy of the criticism frequently made against the validity of the statistical method. The need of such an investigation is quite obvious; but the difficulty lies in the required dual familiarity with both the medical and the statistical difficulties of the problem. In this respect the criticisms of the statistical method in cancer research on the part of the Director of the Imperial Cancer Research Fund are merely negative and of very limited practical utility. The same conclusion applies in part to the following observations by Delafield and Prudden, in the ninth edition of their "Text-book of Pathology," page 353, published in 1911:

It has become evident of late that much of the statistical lore of tumors, especially of malignant types, which has been handed on from one writer to another, is in need of a

*For a discussion of the decline of the death rate throughout the world, see my address on "The Significance of a Declining Death Rate," proceedings First National Conference on Race Betterment, 1914.

critical revision, and that many of the current opinions regarding malignant tumors are based upon alleged observations of doubtful validity and upon inferences hastily and illogically drawn. Among these opinions needing revision may be mentioned *the alleged relative rapid increase in the frequency of cancer*, which rests upon data obviously faulty; the contention that metastases in malignant tumor are closely analogous with metastases in infective processes and indicate the infective nature of the former; the view that carcinoma has been in many instances directly conveyed by contact from a victim of the disease to a well person; the successful inoculation of carcinoma of man into the lower animals. None of these points has been sustained by reliable data.

It has become evident that a new departure is necessary in the study of tumors and that this is especially urgent along two lines: first, in the collection of more reliable statistics, which shall embrace not only man, but the lower animals as well; and, second, the initiation of careful and extended experimental studies of the tumors, especially the malignant tumors, of the lower animals, in which such growths frequently occur spontaneously.

When along these lines the data relating to the biology of tumors shall have been gathered on a large scale, the outlook will be brighter for the study of the fundamental problems of the inciting factors in tumors and of promising measures for their treatment.

Of these interesting suggestions, the first, regarding the collection of more reliable statistics, can be complied with at the present time only to the extent of a more complete and trustworthy presentation of the available official and other statistical data relating to the cancer problem in its various aspects throughout the world. Since no such effort has heretofore been attempted in a really comprehensive manner, it is to be hoped that if the present work falls short of providing an absolutely trustworthy basis of conclusions regarding the apparent or actual increase in cancer frequency, the very considerable amount of statistical material brought together will, for the first time, at least afford an adequate basis of facts for the strictly scientific and critical statistical study of the subject. The material presented is so extensive in the quantity of data and the wealth of detail that it may safely be asserted that no problem in human mortality has heretofore been considered on the basis of an equally adequate amount of statistical data. On the basis of this information it should not be impossible to ascertain with approximate accuracy at least the *direction* in which the required improvement in cancer statistics can be made with least difficulty and with the assurance of practical utility.

The statistical aspects of the cancer problem, with a due regard to the geographical distribution of the disease, have been considered at some length in the third volume of the treatise on cancer by J. Wolff. The statistical references, however, are general, and no attempt is made at correlation or uniformity in the presentation of the facts. Many of the citations are very interesting and exceedingly useful in the statistical study of the cancer problem; but the data are inadequate for the purpose of determining the true rate of increase in cancer frequency in civilized countries, not only for all forms of cancer, but for special forms in particular localities. The investigation by Wolff includes topographical and geological considerations, climate, race, religion, urban and rural conditions, wealth and poverty, occupation, sex, age, etc. The results of the investigation are summarized by this author for the purpose of answering the question as to whether cancer is actually or only apparently on the increase, but no definite conclusion is reached. In brief, it is said that the evidence is not available to prove that there has been an actual increase in cancer mortality, especially of gastric

cancer, and that, in any event, the observed increase is not sufficient to cause serious apprehension on the part of the public. This conclusion is not in conformity to the results of the present investigation, which prove that within less than forty years the rate of mortality from cancer has practically doubled and that the actual number of deaths from cancer in the civilized portion of the world for which reasonably trustworthy data are available exceeds 500,000 per annum.

Uniform Methods of Tabulation and Analysis

The material for the present investigation has, unless otherwise stated, been derived from the original official reports or by means of correspondence with the official department in charge of the collection of cancer mortality statistics. As far as practicable the sources of information are indicated for every table, so as to facilitate further research with particular reference to the mortality experience of foreign countries. It has not been feasible, as a rule, to bring the data further down than to the end of the year 1912.

The tabulation and analysis of each country as far as practicable are made to include the mortality by organs and parts of the body affected, with the required distinction of age and sex. The mortality rates are given in a uniform manner, on the basis of 100,000 of population. With but a few exceptions, the rates are original calculations based upon new or revised estimates of the population for intercensal years. The age and sex distribution of the population has, as a rule, been derived from the official census reports. The use of non-official data has generally been avoided, but occasionally such data have been included for the purpose of completeness, with the reasonable assurance that the authors responsible therefor had derived their original returns from trustworthy sources.

The present discussion does not include an extended critical study of new statistical methods of cancer research. It has seemed of more practical importance to provide the student of the cancer problem with the available material for statistical research, rather than with theories or criticisms however well justified by the facts. It would unquestionably serve a most useful purpose if the method originally suggested by the Director of the Imperial Cancer Research Fund regarding uniform records of hospitals in cancer cases were adopted by at least the leading institutions providing medical or surgical treatment for cancerous complaints. Such uniformity would go far towards eliminating serious errors, which to a considerable degree invalidate the comparative cancer statistics of different countries of the world.

The same conclusion, of course, applies to the general adoption of the standard death certificate and the more general use of the international classification of causes of death. Another difficult problem in this connection is the universal adoption of a generally suitable blank for supplementary cancer inquiries. As an aid towards the better solution of this phase of the cancer problem, the most essential forms in practical use are given in Appendix B.

CHAPTER III

THE INCREASE IN CANCER

Early Mortality from Cancer in London—Causes of Local Variations—Argument by King and Newsholme—Statistics of Frankfurt a/M.—Increase in Cancer by Organs and Parts—Utility of a Cancer Census—Cancer among Primitive Races—Statistical Problems of Erroneous Diagnosis—Evidence of Cancer Increase throughout the World—Misleading Statistical Observations—Useless Controversies—Trustworthiness of American Mortality Statistics—Contributory Causes of Death in Cancer—Continued Increase in Cancer Frequency—Public Menace of Ignorance and Indifference.

The question whether cancer is on the increase is one of the most important problems in modern medicine. If cancerous complaints are actually and relatively more frequent at the present time than in former years, it is self-evident that the underlying causes or conditioning circumstances must be of recent development and the result of changed methods of living or of profound modifications in the human environment. If cancer is not on the increase, but is actually a much more common disease than was generally assumed to be the case in the past, because of misleading statistics or superficial and imperfect diagnosis, then the more trustworthy returns for the present period serve the extremely practical purpose of emphasizing the serious menace of cancer and the supreme importance of more qualified medical and surgical consideration of the subject. For it is self-evident that if the charge is true that in the past a large number of deaths have been erroneously recorded as due to other causes than cancer, when, in fact, such deaths were due to cancerous complaints, the medical and surgical profession must have been grossly derelict in its duty and inconceivably incompetent, considering the high degree of attained proficiency in other branches of medicine and surgery. There are the strongest possible reasons for believing, however, that this lamentable conclusion, which would be virtually equivalent to a charge of gross malpractice against the world's medical profession, is not true. Those who maintain that cancer is not on the increase, but that the higher recorded rate of frequency at the present time is but an evidence of erroneous diagnosis or wrongful classification in the past, can not be aware of the far-reaching significance of their conclusions when concretely applied to the cancer problem. For illustration, in the registration area of the United States, during the decade ending with the year 1913, the recorded cancer death rate increased from 70.2 to 78.9. When these rates are applied to the population of the continental United States as a whole, it appears that during this period there were 658,139 deaths from cancer. If, however, the rate for all the years previous to 1913 was deficient in accuracy, and if, in fact, the rate for that year, given as 78.9, had actually prevailed during each of the previous years, there would have been 706,752 deaths from cancer, or a difference of 48,613. It would seem utterly inconceivable that this number of cancer deaths should have occurred in the United States during a single decade and been erroneously

diagnosed as due to some other disease than cancer. During recent years, however, the cancer death rate has not increased quite as rapidly as during earlier periods, and the contrast would therefore be much more marked if the actual effect of the assumed errors in registration and diagnosis were calculated for a longer period of time.

No one familiar with the facts can question the view that many years ago cancers of the internal organs were quite frequently diagnosed in error, or in any event classified superficially under some other term. Walshe, in his treatise on "Cancer," published in 1844, took occasion to point out that the mortality attributed to cancer was in all probability below the true mark, particularly of those under the head of diseases of the generative organs, especially of the uterus. He remarks:

> A large proportion was in all likelihood caused by carcinoma; the same is true, though to a less degree, of fatal cases of organic disease of the intestinal canal and of "stricture of the rectum and œsophagus" in persons of advanced age.
>
> Whether the frequency of cancerous disease is on the increase is a question of considerable interest, but one to which we cannot unfortunately furnish any very satisfactory reply, as we have not the means of ascertaining the proportion of the population annually cut off by the disease during a series of years. The only statistical facts we can find bearing on this question are given in the following table, showing the ratio of cancerous deaths to the total mortality of the metropolis during the last century.

Mortality from Cancer in London, 1728-1838

Time	Proportion of Deaths from Cancer in Every 1,000 Deaths
From 1728–1757 (30 years)	2.0
From 1771–1780 (10 years)	3.4
From 1831–1835 (5 years)	4.4*
From June 31, 1837, to December 31, 1838 (18 months)†	6.1

In commenting on this table, Walshe points out that

> From this it would, on first view, appear that the frequency of the disease has been steadily increasing during the last 100 years; but the real causes of the augmented ratio are more likely to be the decrease of mortality from epidemic diseases, and the greater accuracy of diagnosis, as respects carcinomatous affections. We must wait for correct answers to questions of this high import, until the present Registration Act has been in operation for a series of years.

It would not serve a practical purpose to inquire too far back into the earlier records of cancer mortality, which for self-evident reasons must have been less trustworthy and conclusive than those derived from official registration returns.‡ It would also be misleading to determine the increase in cancer mortality on the basis of a proportion to the mortality from all causes, although under given conditions this method may yield fairly satisfactory results. The extract from the work by Walshe is merely included as evidence that even seventy years ago the question of cancer increase was receiving critical attention and that the same conclusion was then advanced as now: that the increase was more apparent than real and due primarily to improved diagnosis.

*These three proportional numbers are taken from a table calculated by Dr. Farr, and given at page 577 of his "Vital Statistics."

†The absolute number of deaths from cancer registered in the metropolis during this period was 470, bringing cancer from a position of almost no importance to that of a predominating cause of death.

‡Among the earliest mortality statistics by causes are the returns for the Jews of the Vienna Ghetto, 1648-69, discussed by Dr. Schwarz in the periodical on the Demography and Statistics of the Jews, April, 1910. According to this writer, out of 883 medically or otherwise certified causes of death among the Jews of Vienna during the period 1648-69, only *one* death was due to cancer. (See note on page 23.)

Causes of Local Variations

It is a practical certainty, however, that this argument can be carried too far. A point must be reached, sooner or later, where the margin of error is reduced to relatively unimportant proportions. A definite maximum figure in cancer mortality, however, can not be said to exist. There is an enormous range in cancer frequency from the almost complete absence of the disease to its being one of the principal causes of death in adult life. A maximum point of normal frequency must, of course, be reached in time, particularly in the case of long-settled and densely populated countries. Such a maximum rate, however, would not by any means indicate errors or defects in low prevailing rates for other countries. "Cancer," like "fevers," is an indefinite term and comprehends affections due probably to the same causes or conditioning circumstances, but with fundamentally different results as regards the organs or parts of the body affected. An excessive cancer death rate in one country may be largely due to a high mortality from cancer of the stomach among males; in another country, the excess in the cancer death rate may be chiefly due to a high degree of frequency of cancer of the uterus or of the female breast. Certain forms of cancer prevail in some regions of the globe which are practically unknown in others: the so-called *Kangri* cancer of Kashmir, for illustration, is not met with among civilized mankind.* Cancer of the cheek, caused apparently by slow irritation following the chewing of the betel nut by the women of India, is very rare among Europeans. It is therefore an entirely safe conclusion that gastric cancers or uterine cancers, which are excessively common among civilized races, may be actually very rare among, but not completely absent from, native races, existing under fundamentally different conditions of life. The more thoroughly the geographical distribution of cancer is studied, particularly with regard to the local incidence, according to organs and parts of the body affected, the more definite is the conclusion that observed variations in cancer frequency are real and not apparent; that they are the evidence of a greater or less susceptibility to various forms of malignant disease and not primarily or exclusively the result of incompetence, carelessness or indifference in medical diagnosis.

The Argument by King and Newsholme

One of the most important contributions to the question of cancer increase is the classical essay on "The Alleged Increase of Cancer," by King and Newsholme, originally read before the Royal Society on May 4, 1893. The paper includes an interesting review of the earlier statistics of cancer in England and Wales and the observations of the Registrar-General on the apparent increase in the mortality rate. The experience data of certain insurance companies were utilized, but only to rather limited advantage. The main reliance of the authors was upon statistics of the city of Frankfurt a/M., Germany, which differentiate certain forms of accessible and inaccessible cancers, it being stated that "under accessible cancers we have included only four headings: tongue, mammae, uterus

*For a descriptive account of Kangri cancer, by Ernest F. Neve, M. D., with illustrations, see *The British Medical Journal*, September 3, 1910.

and vagina, all of which are capable of careful and exact diagnosis."* This point of view, however, must be seriously questioned; for it is quite doubtful whether *all* uterine or even vaginal cancers can be accurately diagnosed as such without an exploratory operation or a microscopical examination of the diseased parts. Under "inaccessible" cancers, the authors, on the basis of the Frankfurt data, considered all other forms than those mentioned. Now, obviously, a fair proportion of deaths from cancer are those of the skin, other parts of the mouth than the tongue, and other external parts of the body, which being included among the inaccessible cancers must, to a certain extent at least, have affected the accuracy of the conclusions. A more useful classification of accessible, intermediate and inaccessible cancers, is given by Bashford in the Report of the Imperial Cancer Research Fund on "The Statistical Investigation of Cancer," previously referred to.† Attention was drawn to the fact that the cancer death rate of Frankfurt was quite considerably in excess of the corresponding rate of the United Kingdom, but no satisfactory explanation could be offered for this difference except the extremely careful death certification in use in this German city. To compare the rate of a country with that of a city is in itself quite apt to be misleading. For the five-year period ending with 1910, the cancer death rate for London, combining both sexes, was 111.0, against a corresponding cancer death rate of 96.2 for Frankfurt. The difference on the basis of a more correct comparison was therefore indicative of a higher cancer prevalence in the capital city of England when compared with one of the large cities of Germany. The main contention of Messrs. King and Newsholme, on the basis of the Frankfurt data, was that the apparent increase in cancer was practically limited to the occurrence of this disease in the internal or inaccessible organs, or, in their own words: "Taking a general view of the Frankfurt figures the one result of surpassing importance to be derived from them is that in those parts of the body in which cancer is easily accessible and detected there has been no increase in the mortality from it between 1860 and 1889."

Recent Cancer Statistics of Frankfurt a/M.

For reasons unknown, the authors have not considered it necessary to reexamine into the facts during the long intervening period of time. The Frankfurt data are by no means the most useful or conclusive information for a scientific study of cancer statistics; in fact, the classification fails to conform to modern requirements, in that it is not in accordance with the International Classification of Causes of Death.‡ In view of the

*The problem of cancer increase with special reference to the Frankfurt data has recently been discussed by Prof. Walter F. Willcox in an address before the American Public Health Association at the Jacksonville meeting, 1914. The paper presents the results of an original study of the Frankfurt statistics since 1865, but unfortunately the King-Newsholme classification of internal and external cancers is retained, so that the conclusions can not be considered final. (See also discussion on pages 83-90.)

†The title of this publication is "Scientific Reports on the Investigations of the Imperial Cancer Research Fund," Part 1, Statistical Investigation of Cancer, London, 1905. (See Table 8, Appendix A.)

‡The conclusiveness of the Frankfurt data is very much exaggerated. The population of Frankfurt is only 438,000 and a considerable proportion are Jews. The city hospitals are made much use of by strangers, and it is not entirely clear whether correction has been made for this factor. In view of the extremely complex nature of the cancer problem the statistics for any given community, however large or however extended in point of time, are only of limited utility. They are useful, but not finally conclusive.

value frequently attached to the conclusions on the basis of the Frankfurt data, the more recent statistics have been brought together, as given in the official reports made annually by the Frankfurt Medical Society. The following table exhibits the comparative mortality by organs and parts, for two periods, ending respectively with 1909 and 1913.

Mortality from Cancer in Frankfurt a/M., by Organs and Parts of the Body according to Sex, 1906-1909 and 1910-1913

MALES

Organ or Part	Deaths from Cancer 1906-09	1910-13	Rate per 100,000 Population 1906-09	1910-13	Per Cent. of Increase
Skin	3	6	0.4	0.8	+100.0
Digestive organs	470	540	68.5	74.2	+8.3
Respiratory organs	32	23	4.7	3.2	—31 9
Urinary organs	21	27	3.1	3.7	+19.4
Generative organs	6	8	0.9	1.1	+22.2
Other carcinoma	25	29	3.6	4.0	+11.1
Sarcoma	28	35	4.1	4.8	+17.1
Other malignant tumors	23	46	3.3	6.4	+93.9
Total	608	714	88.6	98.2	+10.8

FEMALES

Organ or Part	Deaths from Cancer 1906-09	1910-13	Rate per 100,000 Population 1906-09	1910-13	Per Cent. of Increase
Skin	12	8	1.5	0.9	—40.0
Digestive organs	447	500	54.4	57.2	+5.1
Respiratory organs	25	17	3.0	1.9	—36.7
Urinary organs	5	20	0.6	2.3	+283.3
Generative organs	244	288	29.7	33.0	+11.1
Other carcinoma	76	80	9.2	9.2	0.0
Sarcoma	26	30	3.2	3.4	+6.3
Other malignant tumors	24	48	2.9	5.6	+93.1
Total	859	991	104.5	113.5	+8.6

Conclusions Opposed to Experience

This table is exceptionally instructive, in that the general cancer death rate is shown to have increased during the last period, compared with the first, from 88.6 to 98.2 for males and from 104.5 to 113.5 for females. Accepting the view that death certification in Frankfurt is considered satisfactory and complete the conclusion would seem incontrovertible that there has been an actual as well as a relative increase in cancer mortality in Frankfurt of 10.8 per cent. for males and 8.6 per cent. for females. Considered by organs and parts, on the basis of a rather unsatisfactory classification, it appears that among males the mortality from *cancer increased in every group* excepting cancers of the respiratory organs, which are relatively

unimportant. Cancer of the skin doubled in frequency; cancer of the digestive organs increased 8.3 per cent., but the earlier rate for this group is distinctly excessive, and a maximum figure has possibly been reached. Among females, cancer of the respiratory organs and of the skin decreased, but all the other groups increased, including cancer of the generative organs, which, according to Messrs. King and Newsholme, were among those classified as accessible. The most recent data for Frankfurt, therefore, do not confirm the earlier conclusion that the increase in cancer was only apparent and not real.*

An important discussion as regards the alleged increase in cancer on the basis of German insurance experience occurs in the Proceedings of the German Society for Insurance Science.† In this discussion it is emphatically denied by the Medical Director of the Gotha that the observed increase in cancer mortality was the result of improved diagnosis. He points out that even in the '80s and '90s cancer diagnosis was sufficiently well developed to provide reasonable accuracy in death certification. The same authority concludes that in only nine per cent. of the mortality from cancer in the company's experience was there a previous record of cancer in the family history.

Increase in Cancer, by Organs and Parts

There are some additional data extant regarding this aspect of the cancer problem, which may be briefly referred to here. For England and Wales the data are available for the two periods 1897-1900 and 1901-10. The mortality of males from cancer of accessible organs increased 27.4 per cent., against 22.2 per cent. for the inaccessible organs and the undefined group decreased 24.0 per cent. Among females the mortality from cancer of accessible organs increased 16.7 per cent., or, including cancer of the uterus, 9.9 per cent.; cancer of the inaccessible organs increased 16.6 per cent., and cancer of the undefined group decreased 32.1 per cent. The English statistics of recent years are, therefore, also in flat contradiction of the conclusions based upon the earlier Frankfurt data. The details for England and Wales, according to organs and sex, are given in Tables 10 to 13, inclusive, of Appendix G.‡

For Bavaria the data are available for the two periods 1905-07 and 1905-10. Among males, cancer of the accessible organs increased 25.5 per cent.; of the inaccessible organs, 5.2 per cent.; and of the undefined group, 4.4 per cent. Among females, cancer of the accessible organs increased 15.6 per cent., or, including cancer of the uterus, 8.3 per cent.: cancer of the inaccessible organs increased 4.8 per cent., and cancer of the undefined group, 4.3 per cent. The statistics for Bavaria, therefore, also confirm the conclusion that the observed increase in the cancer death rate represents a real increase, being found to have occurred chiefly

*See in this connection reference to a recent discussion of the Frankfurt data on page 46.

†Zeitschrift für die gesamte Versicherungs-Wissenschaft, Berlin, 1912, Vol. xii, p. 309.

‡When comparing the cancer mortality of England and Wales for 1901-10 with 1911-12, it appears that the male cancer death rate has increased 16.9 per cent.; the increase in the rate for *accessible* organs is 25 per cent.; for *inaccessible* organs, 18.1 per cent.; the undefined group shows a decrease of 5.1 per cent. The female cancer death rate has increased 7.5 per cent.; the rate has increased 12.1 per cent. for *accessible* organs, excluding the uterus, and 14.4 per cent. for *inaccessible* organs. Cancer of the uterus shows a decrease of 8.9 per cent., and the undefined group a decrease of 3.1 per cent.

in the group of cancers conveniently accessible for the purposes of medical and surgical diagnosis. Of course, the variations in the rate of increase of the different forms of cancer are of considerable importance; but they do not require discussion, being fully disclosed by the tables giving the necessary details. The data for Bavaria are given in Tables 93 to 95 of Appendix G.*

The conclusions of Messrs. King and Newsholme were strongly opposed in an address on the "Increase in Cancer," delivered by J. F. Payne on October 12, 1898, before the Hunterian Society. In 1899 the subject was further discussed by J. H. Richardson, F. F. A., in an address before the Insurance Institute of New Zealand on "Phthisis and Cancer," and in 1901, before the Institute of Actuaries, London, Richard Teece, actuary of the Australian Mutual Provident Society, reconsidered the then available material, which was followed by a discussion participated in by Dr. Payne, Dr. Glover Lyon, Dr. H. Fox, Mr. George King and Dr. Arthur Newsholme. The discussion did not prove or disprove successfully either contention, largely because the new material required for consideration was not then available for critical analysis.

Statistical Inquiries of the Imperial Cancer Research Fund

The next important contribution to the statistical study of the problem of cancer increase was a brief report published by the authority of the Executive Committee of the Imperial Cancer Research Fund in 1905. The joint authors of this report were Dr. E. F. Bashford and Dr. J. A. Murray. The conclusions, however, had no doubt been considered by the members of the Sub-Committee of the Society, including Dr. J. F. Tatham, then Registrar-General, and Dr. Arthur Newsholme. The report includes a brief discussion of the inherent limitations of statistical investigations of cancer, of the fallacies apparently inherent in a cancer census, the importance of age incidence in cancer, the bearing of the provisional results of the statistical study of the Fund upon the question of the alleged increase of cancer, and, finally, important observations on the frequency with which microscopical examinations, in the cases of carcinoma and sarcoma,† were made in operative cases and on post-mortem cases, indicating the presence of conditions leading to the wrong diagnosis of malignant new growths. The report contains many observations and conclusions to which, from a statistical point of view, it is necessary to take exception. The report of 1905 has not been followed by any further publications of a similar nature by the Imperial Cancer Research Fund. An extended critical review of the report would make a useful contribution to the cancer problem.‡

*Bericht ueber das Bayerisches Gesundheitswesen, München, 1912.

†The following concise definitions of carcinoma and sarcoma are from the second edition of Gould and Pyle's Pocket Cyclopedia of Medicine and Surgery, Philadelphia, 1914.

"Carcinoma.—A malignant tumor characterized by a network of connective tissue the areolas of which are filled with cell masses resembling epithelial cells."

"Sarcoma.—A connective-tissue tumor in which the cells so predominate in number, and often in size, that the intercellular substance becomes a secondary element. Sarcomata are maglignant tumors and appear at an earlier age than carcinoma. They are made up of embryonal connective tissue and are of three varieties: the round-cell, the spindle-cell, and the giant-cell sarcoma. They may exist alone or in combination with other tumors."

‡See in this connection *The Lancet*, February 7, 1914, and April 11, 1914, containing correspondence on the Accuracy of American Vital Statistics, with special reference to cancer.

Utility of a Cancer Census

It may be laid down as a first prerequisite of statistical research that the data relied upon shall be sufficient in extent and period of time to provide a basis for accurate and safe conclusions. The report of the Imperial Cancer Research Fund considers a large variety of subjects, all of more or less importance in their relation to the statistical aspects of the cancer problem. The practical utility of a cancer census is considered at some length, but the conclusions arrived at are decidedly adverse to such investigations. It is maintained that a cancer census depends, first, upon the adequate identification of *all* cancer cases and secondly, upon the existence of a standard population in which these cases arise. Neither of these requirements can be met in any statistical inquiry of this kind. Under no conceivable circumstances could any scientific investigation determine the total existing amount of cancerous affections in the entire population, from cases in the very initial stages to cases in the most advanced. As a practical compromise all such investigations are properly limited to the cancer cases under medical observation, as being fully sufficient for the purpose of study and comparison. Dr. Bashford in this connection insists upon a standard population; but a standard population is simply a statistical assumption and an expedient to facilitate the comparison of otherwise varying population factors. A population of any normal country may be assumed as a standard, provided the populations of the other countries are reduced to the same basis of age and sex distribution.*

The authors of the report use the term "actuarial statistics," which is also misleading. Actuarial statistics, properly speaking, are those of life insurance companies, having to do with mortality experience and valuation methods, or, in other words, the practical application of the science of life contingencies to the business requirements of insurance institutions. Such statistics are not necessary or useful in connection with cancer mortality investigations, although it is entirely proper and, in fact, highly desirable that actuarial methods should, under given conditions, be applied to the statistical consideration of certain special phases of the cancer problem.

Dr. Bashford, in the report referred to, maintains that "there is nothing in the statistical investigations of the Imperial Cancer Research Fund which points to an actual increase in the death rate from cancer." Such an important and far-reaching conclusion should be substantiated by indisputable and incontrovertible, as well as a sufficient amount of, statistical evidence. No such evidence is presented in the report for 1905. The further conclusion that "it is not possible to determine statistically whether cancer is really increasing as the increase in the recorded cases would imply" is also not sustained by the facts available, nor justified when conservative and trustworthy methods are employed in the statistical study of the cancer problem. The present work is intended to meet this requirement and to furnish the necessary statistical evidence for a scientific study of the cancer problem from the statistical point of view.

*A cancer census is being undertaken by the State Medical Society of Wisconsin, but unfortunately upon the basis of a blank which is not likely to yield all of the required information. A more elaborate cancer census is contemplated by the Michigan State Board of Health.

Cancer among Primitive Races

There are many other conclusions and observations in the Report of the Imperial Cancer Research Fund on the statistical investigation of cancer which do not stand the test of impartial consideration. The argument, for illustration, that "the relative frequency of cancer in native races cannot yet be even approximately estimated" is not sustained by the many investigations which have been made by qualified medical observers, with an extended practice among native races throughout the uncivilized portions of the world.* It is self-evident that the information regarding cancer frequency in native races can not be considered of equal value with the returns for civilized countries; but it is necessary to refer only to such a painstaking study as has been made of the spread of cancer among the descendants of liberated Africans or Creoles by Dr. W. Renner, published in the annual report of the Sierra Leone Medical Department for the year ending December 31, 1909, to contradict the statement that the relative frequency of cancer among native races "cannot yet be even approximately estimated."†

Cancer Census of Baden

The practical utility of cancer census investigations is unquestionably rather limited; but qualified opinion, certainly on the continent of Europe, seems to favor inquiries of this kind. The Cancer Census of Baden and Hungary, in particular, may be referred to as useful and instructive studies, the results of which are fully commensurate with the labor and expense necessary to collect the facts. The value of such investigations is enhanced by the intelligent correlation of cancer mortality data. In any event, so important a question as the value of a cancer census can be settled only by means of a thoroughly critical and qualified analysis of the facts, which, it may be said, has not been made, or at least has not thus far been published, by the Imperial Cancer Research Fund. The cancer census of Baden, published in 1910, is an exceptionally valuable illustration of the methods of statistical inquiry to be followed in local cancer research. The investigation includes a study of the geographical distribution of cancer according to age and sex throughout the Grand Duchy of Baden, the frequency of deaths from sarcoma, the influence of season, occupation, etc., and the geographical distribution by small subdivisions of territory, such as in this country would correspond to townships. This analysis of the mortality covers the period 1883-1907, and the variations in the rate by single years, are illustrated by maps and diagrams of exceptional clearness. The argument is advanced that the results of such an inquiry would be materially improved if the notification of cancer cases were made compulsory. The occasional disparity in the number of cases reported to the cancer committee, in contrast with the observed mortality, is explained on the

*For much interesting and useful information regarding cancer among native races, see three reports published by the Colonial Office containing the correspondence on the Imperial Cancer Research Scheme, London, (1905, 1906, 1908) and also the discussion on "The Ethnological Distribution of Cancer," by E. F. Bashford, in the Third Scientific Report of the Imperial Cancer Research Fund, London, 1908.

There are numerous special reports on cancer occurrence among primitive races in the volumes of the German Journal for Cancer Research (Zeitschrift für Krebsforschung, 1903-13).

†See in this connection the discourse on the geographical distribution of appendicitis by R. W. Murray in *The Lancet*, July 25, 1914.

ground that in many cases the full cooperation of reporting physicians was not obtained.

Statistical Problems of Erroneous Diagnosis

A strictly scientific study of cancer statistics is unquestionably a difficult undertaking. The problems involved are not only statistical and mathematical, but the medical, anthropological and sociological difficulties are even more complex. As previously pointed out, in England and Wales during the last fourteen years the accessible cancers have increased more rapidly than the inaccessible; and although cancer of the breast is one of the most easily recognized forms, the death rate of this group of cancers is distinctly higher now than in former years.* No conclusive answer has been made to the question as regards the diseases or causes to which deaths from cancer may have been erroneously assigned on the basis of a mistaken diagnosis or an unscientific method of classification. There is no evidence that the disease groups to which cancer might erroneously have been assigned have materially decreased, if at all, coincident with the gradual rise in the cancer death rate. Using the English data, as perhaps the most conclusive, it may first be said that there can be only comparatively few groups of diseases or causes to which cancer deaths could be erroneously assigned; for obviously this could not be the case with zymotic diseases and accidents, pregnancy, infantile diarrhœa, diseases of the nervous, circulatory or respiratory system. Some of these causes, in fact, have increased in recent years; and this is also true of diseases of the urinary system. The first suggestive group more or less related to cancer is that of gastritis, gastric ulcer and other diseases of the stomach; but the death rate of this group, in the English experience, has actually increased from 14.7 per 100,000 of population in 1891 to 15.8 in 1910. The mortality from ulceration of the intestines has also increased from 1.2 per 100,000 of population to 2.4; diseases of the liver and gall-bladder, excluding cirrhosis, however, decreased from 16.3 per 100,000 of population to 5.3; but there has also been a corresponding decrease in cirrhosis of the liver, so that, in other words, all diseases of the liver are apparently decreasing. Yet this is a group which no doubt under an imperfect classification or in consequence of an erroneous diagnosis includes some deaths from cancer, due to the fact that the liver is occasionally the primary seat of the disease. Non-malignant diseases of the ovaries and the uterus have decreased from 4.0 to 2.6; but since cancer of the uterus in England is rather stationary, this decrease is not of practical importance. Ulcers, which are an ill-defined group and most likely to include imperfectly diagnosed deaths from cancer, decreased from 1.8 to 1.3; in other words, the diminished mortality was actually and relatively of no practical importance. Tumors (not specified) diminished from a very low mortality of 0.5 to 0.2; and abscesses, also an insignificant mortality factor, diminished from 1.8 to 0.7. Granting that the decrease in some of these causes sustains the conclusion that the diminution is the result of more accurate diagnosis or classification of

*In the five years 1903-07, the mortality from cancer of the female breast per 100,000 of population in England and Wales was 17.1; during the period 1908-12, the rate increased to 18.6. In 1912 it had further increased to 19.8.

cancer, the combined effect on the general cancer death rate would not be of much practical significance. Deaths in old age, which might hide a considerable proportion of deaths from cancer, which is so exceptionally a disease of advanced adult life, increased from 94.2 to 95.7. Ill-defined and not-specified causes diminished in frequency from 9.3 to 2.3, or 7.0 per 100,000 of population, during the twenty-year period under review, which, of course, is significant; but the decrease since 1901, or during the last decade, has been only 2.2, whereas there has been an increase of 15.0 per 100,000 of population in the cancer death rate during the intervening period of time. The theory of an improved diagnosis or a transfer of deaths to cancer from other groups of diseases or causes is, therefore, not tenable as a general proposition or as an explanation of the recorded increase in the cancer death rate of England and Wales during the last twenty years.* Without enlarging upon this discussion, it may be said that deaths from ulcer of the stomach, biliary calculi, and calculi of the urinary tract, have all been increasing, and some of these rapidly so, in the registration area of the United States during the period 1900-12, and to this extent the conclusions based upon other data are confirmed.

It is not the purpose of this investigation to enlarge upon the statistical aspects of any particular phase of the cancer problem, for in view of the considerable amount of material brought together, such an extended discussion of the facts would be impracticable. The tabular analysis is made available to facilitate an extended statistical study of the cancer problem, but certain phases of the same are taken note of so far as the facts may require to be emphasized or explained.

Conclusive Evidence of Cancer Increase

In the foregoing discussion it has been implied that cancer is on the increase practically throughout the civilized world. It is maintained that this increase is not apparent, but real; in other words, not the result of improved diagnosis or more scientific classification or of a changed age distribution. Combining the returns for the United Kingdom, Norway, Holland, Prussia, Baden, Switzerland, Austria, the cities of Denmark, the Commonwealth of Australia and the Dominion of New Zealand, it appears that these countries in 1881 had an aggregate population of 98,380,000 and 44,047 deaths from cancer, equivalent to a rate of 44.8 per 100,000 of population; by 1891 the rate had increased to 59.6, by 1901 to 76.3, and by 1911 to 90.4. Thus, during thirty years the cancer death rate in these countries, which are typical of the civilized portion of the world, has more than doubled, or, to be exact, the rate for 1911 was 101.8 per cent. in excess of the rate prevailing in 1881. In 1912 these countries had a population of 136,892,000 and 125,832 deaths from cancer, equivalent to a rate of 91.9. If the cancer death rate of 1881, previously given as 44.8, had prevailed in 1912, there would have been only 61,323 deaths from cancer instead of nearly 126,000; if the cancer death rate of 1912, previously given as 91.9, had prevailed in 1881, the actual number of

*The increase in the cancer death rate of England and Wales has continued, and the most recent data are as follows: the average, standardized, cancer death rate for the period 1906-10 was 88.2 per 100,000 of population, increasing to 91.4 during 1911, to 93.7 during 1912 and to 97.2 during 1913

deaths from cancer would have been 90,411 instead of 44,047. Is it a tenable proposition, in view of these facts of observed experience, that the recorded increase in the cancer death rate is only apparent and not real? Is it conceivable that in 1881 in these typical civilized countries of the world 46,364 deaths from cancer were erroneously diagnosed or mistakenly classified under some other terms? No one familiar with the attained status of medical and surgical science in 1881 will be likely to maintain such a preposterous conclusion.

Another illustration is the experience of the State of Massachusetts. In 1871 the recorded cancer death rate was 36.9 per 100,000 of population; by 1881 the rate had increased to 52.3; by 1891 to 60.9; by 1901 to 73.1, and by 1911 to 92.6. In 1871 the population of the State was 1,494,000 and the number of deaths from cancer was 551. If the rate for 1911, previously given as 92.6, had prevailed in 1871, there would have been 1,383 deaths from cancer instead of the 551 actually returned. The State of Massachusetts established the registration of vital statistics in 1842, or five years after the establishment of registration in England and Wales. Boston has for many years been one of the medical centers not only of the United States, but of the world. There are no reasons for believing that medical diagnosis was so crude or imperfectly developed in 1871 that one out of every two deaths from cancer should have been erroneously diagnosed or wrongfully classified under some other disease. Nor is there any evidence to substantiate the point of view that the age distribution of Massachusetts has undergone such profound changes as to account for the higher frequency of cancer at the present time. In 1880 the proportion of population ages 65 and over in Massachusetts was 5.4 per cent.; in 1900 it was 5.1 per cent.; in 1910 it was 5.2 per cent. From a practical point of view in statistical analysis, these changes in the age distribution can have been of only slight effect on the cancer death rate.

Cancer Increase Throughout the World

Limiting the present observations to the changes in the cancer death rate during the last decade, divided into two periods of five years each, and to the principal countries of the world, including the United States, for all of which approximately trustworthy registration returns are available, the facts, briefly summarized, are as follows: For all the countries considered, with an aggregate population of 365,083,000 in 1910, the cancer death rate increased from 67.7 per 100,000 of population during the first five years to 74.3 during the last. The rate of increase was therefore equivalent to 9.7 per cent. The details of this comparison are given in Table 2, Appendix G, on Cancer Statistics of Foreign Countries. The percentage of increase was 28.5 for Cuba, 23.4 for Uruguay, 17.6 for Scotland, 17.2 for Ontario, 16.8 for Brazil, 15.2 for Italy, 15.0 for Ireland, 14.8 for Japan, 12.5 for the Australian Commonwealth, 12.2 for Spain, 11.5 for Hungary, 11.5 for France, 10.2 for British Columbia. Most of these countries have cancer death rates below the average for all of the countries combined. In the countries with a higher cancer death rate, the rate of increase, for self-evident reasons, has been less. A point must be reached beyond which no single cause or group of causes of death can

persistently increase. In the German Empire the cancer death rate increased 8.5 per cent.; in England and Wales, 8.4 per cent.; in Jamaica, 7.7 per cent.; in New Zealand, 7.0 per cent.; in the United States, 6.9 per cent.; in Danish cities, 6.4 per cent.; in Holland, 5.8 per cent.; in Austria, 4.8 per cent.; in Sweden, 2.2 per cent.; in Norway, 1.8 per cent.; in the Argentine Republic, 1.7 per cent.; in Switzerland the rate diminished 1.1 per cent. The rate for Switzerland, however, during the period 1901-05 was 128.3, or nearly double the average for all the countries combined; during the period 1906-10 the rate decreased to 125.9. Next to Switzerland, the cancer mortality is decidedly excessive in the Kingdom of Holland, where in 1906-10 it attained to a rate of 103.5 per 100,000 of population. A cancer census of Holland was published as an appendix to the cancer census of Germany in 1902. In 1911 a special report was issued by the Bureau of Municipal Statistics of Amsterdam, on the mortality from cancer during the period 1862-1902, including some especially interesting data on the comparative frequency of cancer among Jews and Christians. An extremely valuable portion of this report is a table showing separately the deaths from cancer and sarcoma during the period 1897-1902, by sex and single years of life. In 1911 the same bureau issued a special volume of international mortality statistics, including cancer, which, however, unfortunately contains a number of clerical errors, and in which no distinction is made of sex, age, and organs and parts. When the cancer death rates are limited to large cities, they are naturally somewhat higher, partly on account of special opportunities for hospital treatment. This probably explains the relatively higher rates for the cities of France and Denmark and the Argentine Republic (limited to the Province and City of Buenos Aires). These conclusions regarding the increase in the mortality from cancer are fully confirmed by the details of the statistical analysis of the different countries and cities of the world, in another portion of this work.*

The evidence is so convincing that it may safely be maintained that no other statistical conclusion in medicine is so concisely and incontrovertibly established as this; in any event, no satisfactory evidence is available to successfully contradict this conclusion at the present time. If all of this evidence, however, is inconclusive and worthless, then no alternative remains but to discredit the statistical returns of every country in the world with regard to any single disease or group of diseases, although the returns are accepted as approximately accurate with regard to every other important cause of death. More than this, it would seem to follow as a logical conclusion that medicine has not made the progress that it is generally assumed to have made during the last two generations, and that, in fact, even now a colossal amount of public ignorance exists regarding the most obvious evidences of malignant and destructive new growths. There is, however, no substantial ground for such far-reaching

*An important factor tending to reduce the cancer death rate is the increasing practice of surgical operations for malignant disease. The evidence is overwhelming that a considerable number of deaths from cancer are prevented by early surgical operations, and that a large number of deaths from malignant disease are in any event postponed by this means. Deaths must result to an increasing extent from other causes than cancer in the case of cancer patients successfully operated upon in conformity to modern surgical practice. Data are not available to determine the exact effect of surgery upon the cancer death rate, but it is safe to assume that but for the increasing extent of surgical interference the present cancer death rate would be perceptibly higher than is actually the case.

conclusions; on the contrary, the evidence presented will stand the most critical analysis in support of the theory that for practical purposes the law of large numbers applies in the present case as in many other studies of collective phenomena and that the conclusions derived therefrom may be accepted with entire confidence and the reasonable certainty that they will not be materially modified or changed in important particulars by subsequent investigations.*

Misleading Statistical Observations

It is not practicable on this occasion to further discuss the controversial aspects of the question whether cancer is on the increase or not; *the burden of proof rests with those who maintain the negative point of view.* Qualified opinion, generally speaking, on medical or surgical grounds, favors the conviction that cancer is actually and relatively on the increase among civilized mankind. The evidence brought together by R. W. Williams regarding the increase of cancer and its concomitants is quite conclusive. A considerable amount of additional evidence is contained in the Proceedings of the German Society for Cancer Research. Reference, however, may properly be made to an article "*On the Supposed Increase of Cancer*," in the issue of the *Journal of the American Medical Association*, dated June 24, 1899, by E. Andrews, M. D., as an illustration of the misapplication of the statistical method to research work of this kind. Correct statistical analysis presents the same practical difficulties as correct clinical or anatomical diagnosis. The article referred to adds nothing of value to cancer research and tends only to confuse the question at issue. In a similar case in the *Journal of the American Medical Association* for November 10, 1906, Dr. Robert Reyburn quotes Dr. Roswell Park to the effect that "if the present increase of cancer in the United States continues from 1899 to 1909, there will be more deaths from cancer than from consumption, smallpox and typhoid fever combined." This statement on its face is a self-evident absurdity. In an address delivered before a general meeting of the Sixteenth International Medical Congress, held in Budapest, 1909, and reprinted in the *New York Medical Record* for September 4th of that year, Dr. Bashford commits himself to the conclusion that he very much questions "if those persons who have made exaggerated statements to the effect that the recorded increase in cancer represents a true and relatively increased liability to it, have any excuse whatsoever for enhancing the reasonable anxiety of the lay public."

These observations are also applicable to a very recent treatise on "The Cancer Problem," by Dr. William Seaman Bainbridge, which includes a section on "Statistical Considerations." It is difficult to understand what practical value such observations can serve in the medical study of the cancer problem, being simply a heterogeneous collection of mere figures derived from miscellaneous sources. It is not correct, for illustration, to say that "the investigations of the Imperial Cancer Research Fund have shown that the disease occurs among *all* races of mankind." The three official reports published by Parliament regarding

*There is an extended statistical discussion of the cancer problem in the appendix of the annual report of the State Board of Health of Massachusetts for 1900, but the methods of statistical analysis are inadequate to the purpose, and the results of the investigation are, therefore, in the main quite inconclusive.

cancer in the British possessions throughout the world do not include all of the world's races and tribes; nor were the investigations made with the required degree of thoroughness and completeness. It is also not correct to say that in the United States "there are no reliable statistics concerning either the relative frequency of cancer in the past or its relative frequency in the different states, in the different towns, or in towns as compared with country districts." This conclusion is merely a repetition of the views of the Director of the Imperial Cancer Research Fund, who, as shown by his writings, has not the necessary knowledge of American vital statistics. The present work is an emphatic contradiction of the view that American cancer mortality statistics, past and present, are not in a general way strictly comparable with the corresponding data for other civilized countries. It is an error to maintain that the cancer death rate increases from 35 *to the end* of life.* There are trustworthy data to sustain the view that very late in life the cancer death rate is lower than in earlier years. Finally, among other statistical errors, the statement is made that a comparison of the white and the colored cancer death rate is not possible, because, it is claimed, "the South has hitherto been entirely unrepresented by reliable state registration." The required data are not necessarily derived from the states as a whole, but for the South from large and representative cities, and for that reason are at least approximately trustworthy with regard to the negro element.

The Truth of the Cancer Problem

Provided the arguments in favor of the theory that cancer *is* on the increase are based upon trustworthy official mortality statistics, the question at issue is not whether the anxiety of the public is aroused, but whether the public may rightfully be prevented from knowing the truth. From a public point of view it is perhaps immaterial whether cancer is actually or only apparently on the increase or not, but it is of the utmost importance to the people to know whether cancer is in truth more common at the present time than is generally supposed to be the case. If because of erroneous diagnosis or inaccurate classification the cancer death rate has been understated in the past, it is a public duty on the part of all familiar with the facts to make the truth known and to establish the menace of cancer beyond a doubt. Only by means of an accurate perception of the extreme seriousness of the cancer question in adult life can the necessity for the earliest possible recognition and recourse to qualified treatment be brought home to the laity, now largely misled by superficial reasoning and hair-splitting arguments on so important a question from a scientific point of view as to whether cancer is relatively more common among civilized mankind than has generally been supposed

*MORTALITY FROM CANCER IN ENGLAND AND WALES, BY AGE AND SEX, 1901-1910

Ages	Rate per 100,000 Population: Persons	Males	Females
Under 35	5.5	4.9	6.1
35–44	63.7	41.3	84.5
45–54	194.8	154.8	231.9
55–64	417.0	390.2	440.8
65–74	666.2	667.6	665.1
75–84	795.7	794.1	796.8
85 and over	*733.7*	*724.9*	*738.7*
All Ages	90.4	77.3	102.7

to be the case. From a lay point of view it is not a question whether the observed increase in the rate is real or unreal; the question is as to what proportion of mortality is in all probability caused by cancer in adult life at the present time; and no one familiar with the facts can deny that the public is ignorant or woefully misinformed as to the truth regarding the seriousness of the cancer situation considered from this point of view.

Dr. James Ewing in an address on "Animal Experimentation and Cancer" published in the *Journal of the American Medical Association* under date of January 22, 1910, remarks:

> The weight of evidence to-day points almost conclusively to the opinion that cancer is steadily increasing in frequency in man and domestic animals, and that this increase is likely to become more pronounced. Yet, the most diverse opinions exist regarding the alleged increase in cancer, emanating from the varying character of the evidence assumed by different authorities as valid. Surgeons are practically unanimous in the belief that cancer has been steadily growing in frequency during the last quarter-century, and has been appearing at earlier periods of life. Yet such testimony must be regarded as somewhat uncertain and unconvincing.

This is a conservative statement by one who properly takes rank as one of the foremost American pathologists engaged in cancer research in America to-day. It is largely on this ground that it has seemed advisable to bring together the statistical facts regarding cancer as a world menace, and the data made available should prove useful even to the pathologist in the furtherance of specialized efforts in cancer research.

Useless Controversies

In the Fourth Scientific Report of the Imperial Cancer Research Fund, issued in 1911, according to *The British Medical Journal*, of November 11th of that year, Dr. Bashford reverts again to the increase of cancer, in the statement that, with reference to British statistics,

> for the first time, it is fully demonstrated that it is erroneous to make statements of a disquieting nature about the increase of cancer in general. While it is evident that several of the differences brought out by the figures can be explained by more accurate diagnosis and by allocation of the seat of the disease from the secondary to the primary situations, as illustrated, for example, by the relation revealed between cancer of the liver and gall bladder, and the alimentary tract, this may not account fully for certain other features. In particular, the increased incidence of cancer recorded for the mamma in women and the tongue in men, require further study and elucidation.

In this statement it is conceded that cancer of certain organs and parts of the body is obviously on the increase in England and Wales. No one qualified to discuss the statistical aspects of the cancer problem has maintained that *all* forms of cancer are uniformly on the increase or to an equal degree. The rise in the general death rate from cancer may properly be referred to as an evidence of cancer increase, without an elaboration of the details regarding cancer of certain organs and parts of the body. For strictly scientific and medical purposes, it, no doubt, is more advantageous to discuss the separate aspects of the cancer problem, just as this same conclusion applies to fevers or tubercular diseases. No subject can reach scientific perfection except by gradual evolution from broad generalizations to particular points of controversy. It is therefore entirely correct to speak of an increase in the mortality from cancer, even though not all forms of cancer may be increasing or increasing at the same rate; in fact, there is sufficient evidence to prove that certain forms

of cancer in certain parts of the world or particular localities are practically stationary or are actually diminishing. This is a problem of special analysis of cancer data, which, no doubt, is urgently needed, but which has not been forthcoming through the efforts of the Imperial Cancer Research Fund. The subject is again briefly referred to in the Twelfth Annual Report of the Imperial Cancer Research Fund, in which the curious opinion is expressed that "the more general attention to the age factor in official statistics in connection with cancer inquiries has rendered a further statistical report superfluous."

Trustworthiness of American Mortality Statistics

On account of the pronounced position to which Dr. Bashford has committed himself in this matter, it is necessary to refer to an address delivered in the city of New York, at the Academy of Medicine, in 1912. In this address, as reported in the New York *Sun*, under the title "Doubts that Cancer is on the Increase," occurs the statement that Dr. Bashford was unable to obtain American cancer mortality statistics with particular reference to age and sex and organs and parts of the body, because such data were non-existent for the United States or any of its component parts. He therefore was reported to have said that "I cannot comprehend why you citizens of a great state like New York permit this. Doubtless the data exist, but as far as I know they have never been published, and therefore the statistics that mean so much in the study of cancer here are not to be obtained." This statement is in flat contradiction to the facts. Since 1900 at least, complete cancer statistics for the registration area of the United States and its component parts have been published annually by the Division of Vital Statistics of the United States Census, with a due regard to age and sex and organs and parts, and they have been available for some of the states and for many of our American cities for a much longer period of years. It is the particular purpose of the present study to present these facts to the public in a convenient form for the required thorough and extended consideration of what may be properly considered one of the foremost medical problems of the present day.

Contributory Causes of Death in Cancer

It has not been feasible to give even preliminary consideration to the extremely important question of causes of death in cancer patients as disclosed by autopsy records. Obviously concurrent diseases must be relatively common in cancer patients, considering the depressed vitality and diminished disease resistance, at least during the last few months of the cancer patient's life. The only extended study of this phase of the cancer problem appears to have been made by Dr. M. Simmonds, of the General Hospital of Hamburg, "An welchen Komplikationen sterben Krebskranke?" Zeitschrift für Krebsforschung, Vol. I, 1903-04, p. 315. This author, on the basis of 760 autopsies, brings out the important fact that a considerable variation is met with in the contributory causes of death, according to the primary seat of the disease. In brief, the investigation by Simmonds shows as follows: In cancer of the lungs, or respiratory diseases, out of 18 cases, 10 were complicated by pneumonia, 4 by cachexia, and 4 by other diseases; in cancer of the buccal cavity and œsophagus, out

of 117 cases, 47 were complicated by pneumonia, 24 by cachexia, 15 by lung abscess and gangrene, 9 by pleuritis, 6 by pericarditis, 5 by tuberculosis, and 11 by other diseases; in cancer of the stomach, out of 272 cases, 129 were complicated by cachexia, 69 by pneumonia, 19 by peritonitis, 10 by jaundice, 6 by pleuritis, 5 by embolism, 5 by tuberculosis, and 29 by other diseases; in cancer of the intestines, out of 62 cases, 12 were complicated by cachexia, 11 by pneumonia, 10 by pyelonephritis and cystitis, 10 by peritonitis, 6 by ileus, and 13 by other diseases; in cancer of the peritoneum, pancreas, liver and gall-bladder, out of 47 cases, 18 were complicated by jaundice, 16 by cachexia, 8 by pneumonia, and 5 by other diseases; in cancer of the kidneys, bladder and prostate, out of 23 cases, 13 were complicated by cystitis, pyelonephritis and hydronephrosis, 5 by cachexia, and 5 by other diseases; in cancer of the female generative organs, out of 168 cases, 87 were complicated by cystitis, pyelonephritis and hydronephrosis, 28 by cachexia, 21 by pneumonia, 16 by peritonitis, and 16 by other diseases; in cancer of the female breast, out of 46 cases, 30 were complicated by cachexia, 9 by pneumonia, and 7 by other diseases; out of 7 cases of cancer of the skin, 3 were complicated by pneumonia, and 4 by other diseases. This analysis is extremely interesting from the practical point of view of general diagnosis. The investigation shows conclusively that a wide degree of variation in contributory diseases is met with, according to the organ or part of the body affected with malignant disease. For cachexia, which includes general carcinosis, the proportion of complications was 22 per cent. in cancer of the lungs and respiratory organs, 20 per cent. in cancer of the buccal cavity and œsophagus, 48 per cent. in cancer of the stomach, 20 per cent. in cancer of the intestines, 34 per cent. in cancer of the peritoneum, pancreas, liver and gall-bladder, 22 per cent. in cancer of the kidneys, bladder and prostate, 17 per cent. in cancer of the female generative organs, and 67 per cent. in cancer of the female breast. Inflammation of the lungs, including pneumonia, was a complicating factor in 66 per cent. of cases of cancer of the respiratory organs, in 60 per cent. of cancer of the buccal cavity and œsophagus, in 25 per cent. of cancer of the stomach, in 20 per cent. of cancer of the intestines, in 17 per cent. of cancer of the peritoneum, pancreas, liver and gall-bladder, in 17 per cent. of cancer of the kidneys, bladder and prostate, in 15 per cent. of cancer of the female generative organs, and in 24 per cent. of cancer of the female breast.

The relation of the contributory or secondary cause of death to the seat of primary growth is therefore of considerable practical importance.* The investigation by Simmonds shows that in 33 per cent. of the cases there were no serious complications whatever; and in 33 per cent., also, there were direct contributory causes of serious significance, chiefly

*Secondary causes of death in cancer are comparatively rarely mentioned in death certificates. Out of 2,531 male deaths from cancer in the Industrial experience of The Prudential, 1909-10, only 108, or 4.3 per cent., of the certificates of death gave secondary or supplementary causes, including 6 from pulmonary tuberculosis, 1 from diabetes (none from alcoholism), 23 from heart and other circulatory diseases, 8 from pneumonia and pulmonary congestion, 1 from appendicitis, 2 from biliary calculi, 24 from acute and chronic nephritis and 10 from dropsy. Out of 5,304 deaths from cancer among females, the certificate of death gave additional information in 225 cases, or 4.2 per cent., including 13 from pulmonary tuberculosis, 5 from diabetes, 1 from alcoholism, 30 from heart and circulatory diseases, 20 from pneumonia and pulmonary congestion (none from appendicitis), 17 from biliary calculi, 43 from acute and chronic nephritis, 3 from parturition and 11 from dropsy.

pyelonephritis and cystitis, peritonitis, jaundice; in 30 per cent. there were remote contributory causes, not directly related to the cancerous processes, chiefly pneumonia and pleuritis; and in 4 per cent. there were very remote contributory conditions, chiefly tuberculosis, embolism of the brain, and arteriosclerosis, in no direct relation whatsoever to the death from malignant disease. In other words, summarizing the results of this investigation, in one-third of the cases there were no serious contributory causes of death, and in two-thirds there were such secondary complications, of which about one-half were of diagnostic significance.*

Continued Increase in Cancer Frequency

In concluding these observations on the general aspects of the question whether cancer is on the increase or not, a brief reference requires to be made to the discussion of the subject before the Cancer Research Institute, held at the New York Academy of Medicine, May 15, 1913. On this occasion, Prof. W. F. Willcox, of Ithaca, N. Y., in summarizing the arguments of Messrs. King and Newsholme, presented to the Royal Society in 1893, and in supporting their conclusions, said: "After an analysis of this and other evidence it may be concluded that probably the larger part and possibly all of the increase in the mortality from cancer is apparent rather than real," and that "Those who doubt this conclusion and hold that most of the increase is real may interpret the evidence as showing that the real increase is not at a geometrical or even an arithmetical rate, but diminishes as the death-rate from cancer rises and that, perhaps, in certain limited areas, like Switzerland and a few cities, it is already approaching its maximum." Prof. Willcox did not present any new data or an original analysis of the available statistical material, but, as pointed out, he merely summarized his own views, based upon those of Messrs. King and Newsholme and the conveniently available statistics, chiefly those published by the city of Amsterdam in 1911-12, and the annual reports for the registration area of the United States. A death rate from any special cause could not possibly continue to increase indefinitely and *at a progressive rate.* It is self-evident that a death rate from any cause when once it reaches considerable proportions must naturally diminish in its rate of increase, because of inherent limitations. This applies to population growth as well as to mortality. The argument is the same as is frequently advanced in the case of tuberculosis, where it is claimed by the superficially informed and by those untrained in statistical analysis that, because the decline in the tuberculosis death rate in recent years has been at a lower rate than in former years, the deliberate effort to bring about a reduction in mortality has been largely a failure.†

Combining the principal European countries for the period 1896-1900, the average cancer death rate during that period was 69.1 per 100,000 of population. It was as high as 127.4 in Switzerland and as low as

*The most thorough consideration of this aspect of the problem is contained in the 76th Annual Report of the Registrar-General of Births, Deaths and Marriages in England and Wales, London, 1915.

†For a discussion of the statistical aspects of the tuberculosis problem, with special reference to the decline in the death rate, see my address before the National Association for the Study and Prevention of Tuberculosis, Washington, May 8, 1913.

30.7 in Hungary. During the five-year period ending with 1905, the rate increased to 74.2. The actual increase in the rate was therefore 5.05 per 100,000 of population. The rate for Switzerland during this period was as high as 128.3, and for Hungary as low as 39.1. During the five years ending with 1910 the average cancer death rate for European countries was 81.0. There was therefore an actual increase in the rate of 6.81 per 100,000 of population, against 5.05 for the previous quinquennial period, and the percentage of increase in the rate was 9.2, against 7.3 for the previous five years. The theory advanced by Prof. Willcox is therefore not sustained by the facts of actual experience, which, to the contrary, prove beyond a doubt that the actual as well as the relative increase in the cancer death rate in at least some of the more important countries continues progressively at the present time and that for most of the civilized countries a maximum rate is far from having been reached.

The Menace of Public Ignorance and Indifference

The cancer problem is one of the most difficult and perplexing in medicine, surgery and statistics. The mortality from cancer is no longer to be considered indifferently, for it constitutes a real *menace* to all civilized mankind. Irrespective of the reasons why the aggregate mortality from this disease should be so large, amounting, now (1915), in the Continental United States to over 80,000 per annum, it is a self-evident duty on the part of all familiar with the facts to discuss the subject, with a due restraint in their utterance, but with clearness and fearlessness, so that the public may be made aware of the dreadful truth. It is entirely irrelevant and a wrongful use of the critical method to charge those who are convinced that cancer is becoming an increasing menace to civilized peoples with an exaggeration of the situation or with an undue excitement of the public. No harm is ever likely to come to any person by being unduly alarmed on this account.* The harm and the dreadful seriousness lie in ignorance and indifference and in confusion worse confounded by needless controversies over matters which in themselves are at most and at best but secondary to the supreme question as to how malignant disease can be controlled; how it can be prevented, on the one hand, and how it can be successfully cured, on the other.†

*The psychological aspects of the cancer agitation have been discussed by Dr. Römer, of Stuttgart, in the Journal of the German Society for Cancer Research, Berlin, 1906, Vol. iv.

†For a general statement of these aspects of the cancer problem, see my address on "The Menace of Cancer," transactions of the American Gynecological Society, 1913.

CHAPTER IV

MORTALITY FROM CANCER IN DIFFERENT OCCUPATIONS

Review of the Literature on Cancer in Relation to Occupation—Cancer in the Patent-fuel Industry—Pitch Ulceration and Paraffin Cancer—Occupational Incidence—Alcoholism—Prisons and Asylums—Petroleum Industry—Malignant Disease of the Lungs in Miners—Gardening and Agriculture—Cancer among Paraffin-workers—Brewers—Furriers and Skinners—Seamen—Tinplate-workers—Lead-workers—Rubber-workers—Chemical-workers—X-ray Workers—Cancer and Exposure to Light—Cancer in the Synthetic-dye Industry—Occupational Mortality Statistics—Life Insurance Experience—Foreign Statistical Investigations—Requirements of Scientific Statistical Research.

A full discussion of the occupational aspects of the cancer problem is at present out of the question, on account of the paucity of data and the doubtful value of a considerable amount of available statistical information. Most of the cancer statistics by occupation fail to differentiate the organs and parts of the body affected, so that the initial seat of the disease can not be correlated to the known factors or conditions producing irritability, or traumatism, and the resulting malignant growth. Authorities on the subject of workmen's compensation for industrial diseases are very guarded in their references to the interrelation of accidental injuries to cancerous growth, excepting such forms of malignant disease as will subsequently be discussed, with the required brevity, but in sufficient detail to emphasize the points of most practical importance. From a statistical point of view, however, the occupational aspects of the cancer problem are of exceptional interest and deserving of much more technical consideration than has been given to this phase of the subject in the past. The evidence is apparently conclusive that specific injuries to different parts of the body, whether internal or external, especially injuries resulting in a long-continued condition of slight irritability, may develop into cancerous growths of every known variety and degree of malignancy.*

The frequency of cancer naturally varies widely in different occupations and industries. The results of statistical investigations regarding cancer frequency in different employments are, however, often contradictory and, on the whole, rather inconclusive. Cancer as a cause of invalidity is, according to German experience, not of serious importance. Out of every 1,000 recipients of invalidity annuities, the proportion retired on account of cancer was 16 for males and 21 for females. The corresponding proportions for tuberculosis of the lungs were 122 for

*The earliest reference to tumors in relation to occupation occurs in "A Treatise on the Diseases of Tradesmen," by Ramazzini, of which an English translation was published in London, 1705. The references are practically limited to ulcers, the term tumor being used only once in connection with the diseases of musicians and others of this profession. Ramazzini was an exceptionally careful observer, and it is a reasonably safe inference that if malignant disease had been as common as it is to-day, he would have given a descriptive account of it in his work.

Thackrah in his treatise on the effect of arts, trades and professions on health and longevity, published London, 1832, makes, among others, the following references to cancer in relation to occupation. He mentions a French authority to the effect that shoemakers are subject to cancer of the stomach; that bakers are subject to tumors; that grocers are liable to a cutaneous eruption, or a variety of eczema, produced by handling sugar, and that victims of mental depression and care are peculiarly liable to scirrhus of the stomach, medullary and fungoid tumors and other malignant disease.

males and 76 for females. The relative importance of cancer as a cause of invalidity is brought out by the fact that in German experience it was the seventeenth most important cause among males, and the fifteenth among females. Sir Thomas Oliver, in his treatise on "Diseases of Occupation," has observed that

> The relation of malignant disease and injury is frequently raised in medico-legal inquiries. That cancerous and sarcomatous tumors develop after an accident, close to the site of the injury, and that the one is the direct sequence of the other, there is not the least doubt. How the tumor comes we do not always know. A man receives an injury to the right side of his chest and dies ten months afterwards from malignant disease of the liver; another man falls on his head in a shipyard, and a year or two afterwards dies from a sarcomatous growth in the brain. In some cases the connection is clear enough and the claim for compensation can be honestly maintained, but it is absolutely necessary, in all such cases leading to a fatal termination, that a post-mortem examination should be made in order to ascertain whether what is apparent on the surface of the body is the primary or secondary growth.

Chimney-sweeps' Cancer

Concerning chimney-sweeps' cancer the same authority remarks that

> Men following this employment exhibit a liability to cancer several times greater than that of the general population. There is the opinion that the irritant in soot is arsenic, but whether it is this or sulphurous acid or ammonia compounds it is difficult to say. In Newcastle-upon-Tyne we seldom see cases of chimney-sweeps' cancer, although it was the cause of death of one sweep in 1907. In the London hospitals and on the Continent it is not met with so frequently as formerly. According to statistics supplied by Dr. John Tatham, of the General Register Office, the comparative mortality figure for cancer among chimney-sweeps between the ages of 25 and 65 for the three years ending 1902 was 133 as compared with 63 among occupied males at the same ages. This is a lower death rate from cancer in chimney-sweeps than three decades ago, and even later. In his article on dust-producing occupations in "Dangerous Trades," Dr. Tatham gives as the mortality figures from cancer 156 for chimney-sweeps compared with 44 for occupied males. While, therefore, the mortality from cancer has been diminishing in chimney-sweeps, it has been rising in the general population. Although usually met with in the region of the scrotum, the disease may appear on any part of a chimney-sweep's body. It is usually preceded by one or two small warty growths which ulcerate, and these, failing to heal, assume the character of an epithelioma. The glands in the groin subsequently become enlarged, first from irritation and secondly from malignant infection. The disease makes slow but steady progress. Ultimately secondary deposits occur in such of the internal organs as the liver and lungs and in the peritoneal cavity.

Gardeners' Cancer

With reference to gardeners' cancer Sir Thomas Oliver points out:

> Gardeners who are in the habit of sprinkling soot upon plants to protect them from slugs occasionally develop cancerous ulceration of the hand. Soot when repeatedly applied to the skin causes it to become thickened, harsh, and dry. Once structural alterations are induced in the skin, repeated irritation may lead to cancer.

Coal-tar and Pitch Industries

The same authority refers briefly to workers in coal-tar and pitch, etc., as follows:

> Men who work in tar and paraffin and in anthracene, a product obtained from the distillation of gas-coal tar, are specially prone to suffer from warts and skin eruptions. Distillers of benzine and creosote suffer in a similar manner, although not so frequently. Ulcers of the skin in persons who are working among coal-tar and pitch products ought not to be neglected. In the first instance the ulcer may be of a simple character and will heal if properly treated and kept free from irritation. Should it cease to heal, extirpation by the surgeon may be required.

The liability of tar and pitch workers to cancerous affections is more fully discussed by Sir. Thomas Oliver in the extract given below:

Many of the men who follow the employment not only become bronzed and sallow, but their skin becomes the seat of a peculiar cancroid eruption such as is occasionally met with on the scrotum of chimney-sweeps. In other persons there may be bronchitis, digestive disorders with dark stools, also ulceration of the nose. The question as to whether manipulation of tar products or exposure to the fumes given off by coal-oil and tar is capable of giving rise to cancer has come before me in the case of three men employed in grease works. These men in following their employment all worked with their sleeves rolled up to above the elbow. It has been observed in the trade that when men have warts on their hands these frequently disappear when they first undertake the work, and, on the other hand, that in men whose skin has been quite healthy, wart-like growths are apt to develop when they have followed their employment for some time. In addition to the warts, of which there may be as many as from thirty to forty on the hands and forearms, there develop hard nodules in the skin which ulcerate and often exhibit very little tendency to heal. The edges become hard, and the ulceration, extending to the deeper tissues, may ultimately involve t' e bone and necessitate, as in the case of one of the men I have alluded to, amputation of the arm. The appearances presented by the ulcer are those of the type of cancer known as epithelioma. The presence of these warty growths on the forearms and hands, and of ulcers that tend to take on malignant characters, in tar and pitch workers is so frequent that they must be in some way or other associated with the employment. The morbid processes advance very slowly, and therefore do not readily unfit the individual for work. In many instances removal of the ulcer is not followed by any recurrence of the growth, but a return to the work lays the person open to fresh developments. On the forearms of one of the grease workers above mentioned there are numerous small patches of induration, some of which have ulcerated and exhibit no tendency to heal. The edges of the ulcers are hard and brawny. There are, in addition, scattered all over the forearm numerous black warts of various sizes, also several scars of a pale color compared with the bronzed skin that surrounds them. One of these men, aged fifty-eight, has worked among coal-oil and tar products for thirty years. The scars referred to are the remains of ulcers that have healed. In the case of his son, aged twenty-seven years, the ulceration took on the characters of malignant disease, and on that account the arm had to be amputated above the elbow. Although it is usual when the disease is treated by surgical operation for no recurrence of the growth to take place, in this particular instance the glands in the armpit and neck became subsequently enlarged owing to infective particles having reached these glands by the lymphatics, and the patient became the subject of secondary cancer. Microscopical examination of the ulcer leaves no doubt as to the cancerous nature of the lesion.

Cancer as an Occupational Disease

The predisposition to cancerous affections in certain occupations is attracting attention on account of the pecuniary aspects of the modern doctrine of workmen's compensation. In a treatise on "The Law of Compensation for Industrial Diseases," by Edward Thornton Hill Lawes (London, 1909), the subject is referred to in part, as follows:

Epitheliomatous Cancer or Ulceration of the Skin, or of the Corneal Surface of the Eye, due to Pitch, Tar, or Tarry Compounds.

Description of Process.—Handling or use of pitch, tar, or tarry compounds.

Epithelioma is a cancerous growth of the cells of the skin. It is the least malignant form of cancer, and on removal it is not usually followed by recurrence.

Tar has a peculiar and irritating action upon the skin which varies in intensity. Those who handle and use pitch or tarry products, men employed in unloading, in making briquettes (which are a mixture of pitch and coal dust), in handling "coal oil" or creosote, are all liable to suffer from warty growths, which ulcerate and may become the seat of epitheliomatous cancer. The growths occur on any part of the body, especially the face, hands, and scrotum, and are often accompanied with a dark pigmentation of the skin. They commence as small nodules, but soon break down, forming an ulcer covered by a crust, which gives the appearance of the so-called wart. The underlying ulcer almost invariably heals up. leaving a small scar when the crust has fallen off. If the growth becomes epitheliomatous the situation is almost invariably on the scrotum, when it involves the neighboring

organs and tissues. It is then much the same as chimney-sweeps' cancer, and may be serious, as it can only be arrested by free excision, and the patient may lose one or both testicles. Cleanliness is a very necessary precaution, but in spite of this, the disease may develop. The length of the incapacity is not great in most cases, and the worker may completely recover and resume his work. Particles of pitch striking the eye may cause inflammation of the conjunctiva (the mucous membrane covering the eye-ball) and the cornea. This may be very serious; cases of this kind are said to do very badly. It is said that the pitch getting into the surface of the eye causes a wound which lets in bacteria which induce a septic inflammation, and there is danger of loss of sight.

Scrotal Epithelioma (Chimney-sweeps' Cancer).

Description of Process.—Chimney sweeping.

Soot sets up an irritation of the skin similar to pitch and tar, and with similar results as described under the last heading.

This cancer of the scrotal region is so prevalent amongst chimney-sweeps that it owes its name to this fact, and though it is occasionally found in other people, it is distinguished from other forms of cancer, and is characteristic of the trade, and is therefore scheduled separately. Amongst chimney-sweeps it has been the cause of excessive mortality. According to the Registrar's figures for three years the comparative mortality from this disease was 133 per 1,000, as against 63 amongst other* occupied males of the same ages [i. e., 25-64].

This form of cancer is invariably cutaneous and of slow growth: it is frequently preceded by a warty ulcerous growth, which may exist for some time before becoming cancerous, but the warts described as common among pitch workers are not so frequent in chimney-sweeps. There is probably some unknown property in soot which makes it cancerous: not merely its grittiness. See, however, Dr. Butlin's opinion contra, p. 56 of the Minutes of the Industrial Diseases Committee, 1907. Cleanliness is an important precaution.

Cancer in the Patent-fuel Industry

The following are interesting references to cancerous affections in certain occupations, from the annual report of the Chief Inspector of Factories and Workshops for 1908:

The reportable cases of epithelioma are likely to increase in number as this addition to the schedule of diseases of occupation becomes better known throughout the large patent fuel works in certain parts of the division. Mr. Hilditch (Swansea) reiterates his opinion that anthracene is the root cause of this trouble. In support of that view he cites the case of a man, recently seen by him, who was covered with warts on the exposed surface of his body, and who had been using anthracene oils for many years, but had not been employed at patent fuel or tar distilling works, neither had he handled much pitch.

No doubt in consequence of the prominence given to epitheliomatous cancer and pitch ulceration by inclusion in the third schedule of the Workmen's Compensation Act, 1906, four reports were received of cases in the fuel works of Swansea and Cardiff in which operation had been necessary. Mr. Owen Edwards (Cardiff) investigated the cases in Cardiff and, helped by Dr. Paterson of that town, brought to light four other cases. With Mr. Edwards I visited the fuel works in his district and examined over 100 men. No new cases were discovered, but the skin of several workers showed the characteristic warts. Further inquiry by us is in progress for the purpose of securing generally throughout this industry provision of sufficient and suitable washing and bath accommodation, as there is general consensus of opinion that the cancerous condition can be prevented by scrupulous cleanliness.

Dr. Collis, on information received from a certifying surgeon, examined the workers in an engineering workshop, some of whom were suffering from eczematous ulceration of the hands and arms, attributed to a doubly refined Russian turpentine. Two sets of men suffered (1) those employed in wiping steel plates with turpentine, and (2) those using a paint made up with the same turpentine. Of twenty men thus employed one-half were or had been affected. He recommended (1) a different turpentine in the mixing of the paint, (2) supply of grease for removing the paint from the skin instead of the turpentine which was being used, and (3) leather or other hand holders reaching half up the forearm for men engaged at the power presses.

In the report of the Chief Inspector of Factories and Workshops for

*This should read "all occupied males."

1909 occurs the following description of ulceration of the skin and epitheliomatous cancer in the manufacture of patent fuel and grease:

The inquiry into this subject made by myself, in Cardiff with Mr. T. Owen Edwards, and in Swansea with Mr. J. H. Hilditch, has been published as a separate report. The number of men examined was 277. In those most exposed to pitch dust the hair follicles and sebaceous glands become the seat of a minute plug of pitch. Irritation with formation of shotty papules follows as the secretion of the glands becomes obstructed. These are most marked on the forehead, neck, and ulnar side of the forearms. The sebaceous glands, especially behind the ear where washing is less likely to be thorough, become very prominent and comedones are generally noticeable. Sometimes there are scattered patches of pigmentation over the arms with hyperaemia and distension of the small veins, or the epithelial layers of the skin become thickened with formation of definite warts. Only exceptionally do the warts take on a malignant character, and then usually, but by no means invariably, the scrotum is the seat of the lesion.

Suggestions for regulations to apply to occupiers and persons employed were made in the report, including (1) bath (preferably douche bath) and washing accommodation, (2) overalls, (3) encasing of elevators and disintegrating machines, and (4) wire goggles to prevent damage to the eyes from flying particles of pitch in breaking, crushing, etc.

Protective Regulations

Draft regulations providing for the sanitary conduct of the patent-fuel industries are referred to in the report of the Chief Inspector of Factories and Workshops for 1910:

Manufacture of patent fuel and grease.—As the result of inquiry and report by Dr. Legge on ulceration of the skin and epitheliomatous cancer to which the workers in these trades are liable, draft regulations have been drawn up for the manufacture of patent fuel and issued to the manufacturers concerned. Certain objections to these have been received, and the Secretary of State has, in pursuance of s. 81, appointed Mr. A. H. Lush, barrister-at-law, to hold a public inquiry.

As regards the actual frequency of epithelioma in the patent-fuel industries, the following extract from the annual report of the Chief Inspector of Factories and Workshops for 1911 is of interest:

Epithelioma.—Eleven cases under this head were reported from patent fuel works in the Cardiff and Swansea districts, but none of them appear to have been serious.

Also the following in connection therewith, from the same report, on the proposed draft regulations for the industries engaged in the manufacture of patent fuel and grease:

Following on the receipt of objections to the draft regulations issued in 1910 for this industry, the Secretary of State, in pursuance of s. 81, appointed Mr. A. H. Lush, barrister-at-law, to hold a public inquiry, which was opened at Cardiff on April 26, 1911, and continued there and at Swansea and London on thirteen subsequent days. The Commissioner* recommended that further consideration of the draft regulations should be deferred until October, 1912, to allow time for experiments which the employers, with the cooperation of the workmen, were prepared to undertake. These will necessitate the installation of baths on a moderate scale in one or more of the principal factories at Cardiff and Swansea; volunteers from among the men will give the baths a fair and complete trial, by taking a bath daily for at least a week. By this means, it is hoped to settle the question whether the cleansing of the skin is not more effective, and the tendency to irritation less, if the washing is done immediately after work, when the skin is still hot and the pores open. Investigation is also being made as to other matters, especially as to the possibility of adopting some form of overalls and goggles suitable to the special conditions of this trade.

Eczematous Ulcerations

Some extended comments on eczematous ulceration in the manufacture of pitch, brought out by means of a prolonged inquiry held in South

*Report to the Secretary of State on the draft regulations proposed to be made for the manufacture of patent fuel (briquettes) with addition of pitch (London: Wyman & Sons, Ltd., 1911. Cd. 5878).

Wales, are given in the report, but they can not be included in the present abbreviated account. They, however, should be taken into consideration in connection with any special study of the subject. The following portion of the remarks is pertinent to the present discussion:

Incidentally the inquiry in an unexpected manner gave an impetus to the subject of cancer research. When the draft regulations were first issued objection came from two iron works in Scotland, where briquettes were made as a very subsidiary business, that evidence of warts, so common among workers with gas works tar pitch, was absent in persons handling blast furnace pitch. This I found was the case and a clause had to be added to the draft regulations expressly exempting from their scope factories or workshops in which no pitch other than blast furnace pitch was used in the manufacture of briquettes. There are marked chemical differences between the two kinds of pitch, depending partly on the nature of the coal from which they are derived and partly on the much lower temperature of distillation of blast furnace than coal gas tar.

Sanitary Precautions

A special report upon the progress made in the South Wales patent-fuel works, following the recommendations of the commissioner appointed to investigate the industry with reference to pitch ulceration, is referred to in the annual report of the Chief Inspector of Factories and Workshops for 1912. It is stated that

Washing accommodation has been provided, and suitable use made of it in some of the works. Elevators for the mixture of pitch and coal have been encased, and attempts have been made to relieve the skin irritation by the use of lotions and ointments. The public inquiry will be resumed during 1913.

A more extended reference to the subject of pitch ulceration occurs in the same report, being the observations of the Medical Inspector, as follows:

Dr. H. C. Ross has widened considerably his experiments in connection with this subject.* From Mr. W. J. A. Butterfield, F. C. S., Secretary of the Metropolitan Gas Referees, he received a number of samples of different kinds of pitch, coal tar fractions, distilling at different temperatures, and from them he concluded that the dangerous principles are contained in the heavy oils of the coal tar. They can not be distilled out completely without ruining the pitch, but it would be well if distillation were carried to the utmost point compatible with producing serviceable pitch. The dangerous principles are not anthracene or anthracene oil, but are probably some substances intimately mixed with them which distil over at the same temperatures. What they are we do not yet know. Dr. Ross, after experiment, does not consider acridine to be the cause of the trouble. For the purpose, however, of ridding the tar of the noxious ingredients, washing the tar, if the works concerned can undertake it, offered, so far as he could see, much the most satisfactory solution of the difficulty. Tar distillers, unfortunately, represent that water is their greatest enemy, and if so treated processes of distillation would become dangerous from the frothing of the tar in the stills, as the only means of separation would be by distillation.

In later investigations with numerous samples of coal, Dr. Ross has found both auxetic and kinetic properties present in bituminous samples, but in no case to anything like the degree they are in pitch or tar.

Progress has been made in the South Wales patent fuel works, following on the Commissioner's recommendations (to which reference was made in the last annual report). Washing accommodation has been provided, and suitable use made of it in some of the works. Elevators for the mixture of pitch and coal have been encased, and attempts made to relieve the irritation caused to the skin, by use of lotions and ointments. The public inquiry will be resumed in 1913. Cases of similar epitheliomatous ulceration have been reported during the year from tar works.

The established occurrence of cancer as an incidental result of the manufacture of patent-fuel, or fuel briquettes, consisting of coal-dust and

*"The Problem of Gasworks Pitch Industries and Cancer," John Murray, London, 1912.

pitch in the usual proportion of nine to one, suggests the importance of a careful study of this industry in the United States, since the same has assumed considerable proportions within recent years. There were nineteen plants engaged in the manufacturing of fuel-briquetting in 1912 using as a base anthracite culm, bituminous or semi-bituminous slack, carbon residue from gas manufacture and peat. The binders used varied also, and of the nineteen plants in commercial operation during 1912, ten used coal-tar pitch as a binder, one used asphaltic pitch, two used water-gas pitch and four used mixed binders, the composition of which was not made public. There appear to be few recorded cases of so-called pitch cancer in this country, but it is quite possible that increasing attention and more careful observation may prove that ulcerations of the skin, and possibly cases of true cancer, occur in this country, as well as in England and Wales, in connection with the manufacture of patent-fuel, etc. It should be stated, however, in this connection, that a case of multiple cancer of the skin in a tar-worker, who developed several scores of epithelial lesions in various stages of development upon the hands and forearms and a large epithelioma upon the scrotum, has been reported by Dr. J. Frank Schamberg, of Philadelphia. The case suggested to Dr. Schamberg the possibility of radio-activity in coal-tar, and to test this assumption, according to the *Medical Record*, he "placed a copper cent, a flat key and a small brass numeral upon a photographic plate in a pasteboard negative box lined with black paper. Upon the under surface of the lid he attached a piece of cardboard smeared with coal-tar, so that the board faced downward. This box was placed in a black Japan tin cash-box and the latter was shut in a dark closet for twenty-four hours. When the plate was developed a distinct shadowgraph of the three objects was seen on the negative." This test of coal-tar radio-activity is conceded by Dr. Schamberg to be hardly conclusive, but he observes that "If coal-tar was proven to be radio-active, it would seem that this radio-activity might be responsible for the cancer in tar-workers." According to another account, Dr. Schamberg examined about twenty men whose work caused them to be smeared with tar. In the manufacture of tar-paper the men's arms are soiled with tar and their clothing is more or less saturated. Most of the men said that they suffered from time to time with outbreaks of "yellow-heads" on their arms, but these soon passed away. In a number of workmen he saw mild acne-form eruptions on the arms resembling a folliculitis. Five workmen were found showing evidence of beginning or well-developed cancer.*

Recent Data on Pitch Ulceration and Paraffin Cancer

The subject of *pitch ulceration* is again referred to in the annual report of the Chief Inspector of Factories and Workshops for the year 1913, with special reference to the second report of the Special Commissioner on the draft regulations for the manufacture of patent-fuel with addition of pitch. In the light of practical experience it was found that the regulations were burdensome and not effective; and no evidence had been forthcoming to prove that the taking of baths was a complete

*An extended discussion on the relation of tar and paraffin manufacture to cancer occurs in the second volume of J. Wolff's treatise on Cancer, pp. 145-149.

prevention of the evil, nor was it evident that this requirement would be suitable for all workmen under all conditions. It had thus become obvious that the objects of the draft regulations might be better secured by some other method and it was therefore intimated that the regulations might be withdrawn "provided a satisfactory arrangement could be come to for carrying out voluntarily by the employers certain improvements which the home office deemed essential for the protection of the workers." A new arrangement satisfactory to all parties concerned was therefore made, including provision for baths, wash-basins and accommodation for clothing, on a scale which, in the absence of compulsion, should be amply sufficient for all requirements, and also the encasing of the coal-elevators, as well as those that carry the mixture of coal and pitch, to the reasonable satisfaction of the Inspector of Factories. The number of cases of pitch warts, or of epitheliomatous cancer as a result of them, which were reported to the Factory Inspection Department during the year 1913 was 19, of which 3 were recurrences in persons previously reported.

A reference occurs in the Annual Report for 1913 to a number of cases of "Paraffin Cancer," defined as a disease shale-oil workers are peculiarly liable to suffer from. The disease is briefly described as "having its onset in a variety of forms, i. e., as an erythema, pimples, papules, etc., these gradually dry up, forming hard crusts, which, increasing in size, form hard elevated wart-like masses. As they increase in size these break down, forming sloughing ulcers or paraffin cancers. He mentions three cases: (1) On the dorsum of foot, doing well after operation; (2) scrotal, so far doing well after extensive operation, and (3) back of wrist, necessitating amputation of the right arm at shoulder." The process is quite fully described and the conditions are pointed out under which the disease may be made subject to a reasonable degree of control.

The border-line between cases of this kind and benign skin affections due to occupational exposure is ill-defined. An increasing amount of trustworthy evidence is, however, gradually becoming available, which would seem to warrant the conclusion that malignant disease as the result of occupational exposure is of more serious importance to the workers affected than is generally assumed to be the case.*

Mortality from Cancer in Different Occupations

A general discussion of cancer in relation to occupation occurs in the treatise on "The Natural History of Cancer," by W. Roger Williams. On account of the high authority of Dr. Williams, his observations are given in full, as follows:

Although it cannot be said that persons of any rank or station in life are exempt from cancer, there are, nevertheless, some remarkable differences in the incidence of the disease, among the various social strata. I have already had occasion to point out the much greater prevalence of cancer among the well-to-do, and among the agricultural community, than among the less prosperous of the industrial classes in our great towns, as well as its comparative rarity among paupers, lunatics, and the prison population.

Perhaps the most significant result hitherto attained by statistical investigation of this subject, is that arrived at by Dr. Tatham, who found that the mortality from cancer during the decennium 1881-1890, was more than twice as great among well-to-do men

*See in this connection a recent treatise on "Occupational Affections of the Skin," by R. Prosser White, London, 1915, pp. 26, 85, 93-94; also "Diseases of the Skin," by Ernest Gaucher, London, 1910, pp. 186, 267, 440.

having no specific occupation, as among occupied males in general, the respective cancer mortality ratios being 96 for the former and only 44 for the latter.

In like manner, Aschoff has shown that, in the Berlin population, cancer was of most frequent occurrence among persons of independent means, living on their income or pension.

All statistics show that printers, compositors and pressmen experience a very low cancer mortality, while their death rate from tubercle and their general mortality are both very much in excess of the average; and this class is notoriously one of the most intemperate as regards alcohol, etc., in all modern communities. According to the Twelfth United States Census Report, for the year 1900, the cancer death rate for this class was 22 per 100,000 living, the corresponding figure for pulmonary tubercle being 435.

Another class of workers but little prone to cancer are the miners—especially coal miners—and quarrymen; the United States statistics for this class show a cancer death rate of 33; and a phthisis death rate of 120. Aschoff's Berlin data place the miners next to the printers, in respect to comparative immunity from cancer.

In England, there are few districts where cancer is less prevalent than in the great colliery centres of Derbyshire, South Wales, Durham and Lancashire; and in the mining and quarrying districts of Cornwall, North Wales and elsewhere, very low cancer death rates also prevail.

With regard to the very high mortality of chimney-sweeps from cancer, as shown by the English national statistics, I am inclined to think that the calculation is based on too small a number of cases to give a reliable average, and is otherwise defective; at any rate, nothing of the kind has been noted in the United States, nor in Continental European countries.*

Moreover, cancer of the corresponding anatomical part in women—the vulva—is nearly as common as cancer of the scrotum in males; for, of 4,628 primary cancers in females, 104 were of the vulva, or 2.2 per cent.; while of 2,669 cancers in males, 76 were of the scrotum, or 2.8 per cent.

In general, cancer is comparatively infrequent among the working classes of our large towns, especially in the great industrial centres, and among the cotton and textile operatives, iron and steel workers, etc. On the other hand, among the well-to-do, the cancer mortality is certainly much in excess of the average. Thus, among the leisured and professional classes, the United States Census Report—for 1900—shows that high cancer death rates prevail, especially for the clergy, merchants, brewers, hotel and restaurant keepers, hotel servants, butchers, agriculturists, sailors, commercial travellers, carpenters, etc.

Workers in soot, tar, paraffin, arsenic, etc., are specially prone to certain forms of cutaneous cancer; and it has been reported, that those employed in particular cobalt and nickel mines are prone to quasi-malignant pulmonary disease.

There are good reasons for believing that farm laborers, gardeners, sailors, and those who follow out-of-door occupations are unduly prone to cancer of the lower lip.

Of 36 men with cancer of the lower lip who came under my observation in London hospital work, 5 were farm laborers, 5 general laborers, 3 sailors, 2 bricklayers, and 1 each as follows: sadler, cowman, blacksmith, stoker, worker in a paper factory, piano-maker, sewerman, bailiff, gardener, brazier, carpenter, gas-fitter, costermonger, carman, commercial agent, boatman, waiter, soldier, fireman and groom.

The large proportion of patients engaged in out-of-door occupations comprised in this list is very remarkable; especially when regard is had to the sedentary occupations followed by the great bulk of the London population, whence these cases were drawn.

With regard to the influence of occupation on the liability of women to malignant disease, perhaps the most significant item hitherto elicited is that brought out by the United States Census Report for 1900, which shows that domestic servants are unduly prone to cancer; thus, during the age-period forty-five to sixty-five, their mortality from this cause was double the average; and, at ages above sixty-five, it was triple the average. Cancer death rates, above the average, were also noted among nurses, midwives and school-teachers.†

With regard to the female hospital patients with cancer, under my observation, most of them had been supported entirely by their husbands' earnings; but such of them as had worked for their living—whether married, widowed or single—had followed the following occupations in 142 cases: thus, domestic service, 62 (cook, 17, charwoman, 13, house-

*Chimney-sweeping as practised in England is virtually an unknown occupation in the United States.

†All of these observations and conclusions, especially with reference to conditions in the United States, must be accepted with extreme caution, on account of the paucity of the data considered and the probable incompleteness of the census returns.

keeper, 6, other forms of domestic service, 26); needlework, dressmaking, etc., 28; sick nurse or midwife, 16; laundry, 16; governess or school-teacher, 7; factory, 7; shop assistant, 4; barmaid and actress, of each 1.

Relative Occupational Incidence

Among the more recent authors on cancer, a brief reference may be made to the observations by Charles P. Childe, in his treatise on "The Control of a Scourge; or How Cancer is Curable," published in 1906:

No theories that I am aware of have been formulated in regard to occupation as a cause of cancer. The following comparative mortality returns, emanating from the Registrar-General, show that no occupation is exempt from it, just as no climate or locality is exempt from it, but do not suggest any conclusion as to its origin being dependent upon occupation or habits of life. All occupied males, 44; all unoccupied males, 96; grocers, 34; clergy, 35; potters, 35; coal-miners, 36; farmers, 36; fishmongers, 42; medical practitioners, 43; blacksmiths, 45; fishermen, 46; porters, 48; general laborers, 48; drapers, 49; shoemakers, 50; dock and wharf laborers, 51; tobacconists, 51; plumbers, 53; inn-keepers, 53; coal-heavers, 56; butchers, 57; coachmen and grooms, 58; tool and scissors makers, 58; gas-workers, 59; lawyers, 60; merchant seamen, 60; maltsters, 61; commercial travellers, 63; inn and hotel servants, 65; brewers, 70; inn-keepers in London, 70; chimney-sweeps, 156. An examination of these figures apparently proves cancer to be very haphazard in the selection of its victims, except in the case of chimney-sweeps, who, it will be seen, more than double any other class. This exception has generally been considered evidence that it is connected in its origin somehow with local irritation of various kinds, soot being the *fons et origo mali* in this instance.* Apart from this exception, the figures apparently leave us in the dark. For instance, we find clergy sandwiched in between grocers and potters, medical practitioners between fishmongers and blacksmiths, lawyers between gas-workers and merchant seamen, and so on. The tables seem to show that it is more a matter of chance than anything else, and that occupation has nothing to do with it.

Relation to Alcoholism

The subject of cancer in its relation to trades and occupations is discussed by Rollo Russell, in his treatise on "Preventable Cancer,"† in part, as follows:

A few observations, which have been confirmed by all later experience, were made forty or fifty years ago on the excess of cancer to which certain occupations were liable. It has long been known that chimney-sweeps in England have been attacked in a particular way, and it has been known for some years that gardeners and others who handle soot, tar, etc., are more likely than others to be attacked by cancer in the hand.

After discussing the comparative mortality from cancer and alcoholism in specified occupations,‡ Russell points out that

The record exhibits very clearly the liability to excessive liquor-drinking in all these occupations, especially in brewers, sweeps, general laborers, and butchers, and may be compared with the high cancer rate of the same trades. The excess in sweeps tends to prove that the condition of body and blood renders them specially liable to the local dangerous irritation of sooty matter. This explains the non-liability of foreign sweeps,

*Since the use of the long brush for sweeping chimneys, chimney-sweeps' cancer is diminishing.

†"Preventable Cancer," Rollo Russell, London, 1912.

‡The relation of alcoholism to cancer has been discussed in "A Second Study of Extreme Alcoholism in Adults," published by the Sir Francis Galton Laboratory for National Eugenics, London, 1912. The occasion for the discussion was an extended reference to the alleged excess in the mortality of inebriates from malignant disease and tuberculosis, summed up in the statement that cancer was more than eight times more common among inebriates than among the population of the country at large. Subjecting the data to critical analysis, it was found by Mr David Heron, in charge of the investigation, that, quite to the contrary, the actual mortality from cancer among the inebriates exposed to risk was less than the expected. Both investigations, however, are impaired in value by the paucity of the data considered, there having been only 865 inebriates exposed to risk, of which ten suffered from cancer and five died from the disease during sentence. Out of 2,767 inebriates committed to the reformatory, twenty-four suffered from cancer, of whom ten died from the disease. It would obviously be unsafe to rest far-reaching conclusions one way or the other upon so small a numerical basis of fact.

who are not particularly intemperate, to sweeps' cancer.* In the United States, sweeps' cancer is almost unknown; in Belgium, where coal like the English is used, there is almost complete immunity, *but great care is taken to prevent contact with soot;* in Germany the practice is to wash daily from head to foot.

An investigation of cancer statistics in Germany by the German Committee for Statistical Study was analyzed by Dr. Hirschberg. In men, cancer of the stomach preponderates, with 413 per mille; in women, cancer of the breast, with 243 per mille cases. No special trade liability was found in sweeps, chemical workers, etc. The agricultural classes were attacked more in the skin; those engaged in the timber trade more in the glands. Cancer of the urinary organs was specially common among the well-to-do. Acid wines and cider seem to give a predisposition to gastric cancer.

In the report of the Commissioners of Prisons and the Director of Convict Prisons for the year ending March, 1911, it is stated: "Cancer, the mortality of which increases at every age-group and for each sex in the general population, is again noticeably low in the prison death rate, and this is not due to the fact that prisoners so suffering were released on medical grounds, for only three were released for this cause from local prisons."

Cancer Occurrence in Prisons and Asylums

After calling attention to the fact that on the basis of official reports the cancer mortality in asylums was exceptionally low, Russell remarks:

The low rate of cancer in prisons and asylums is the more worthy of consideration on account of the class from which those detained are drawn. The prisons include a very large proportion of hard drinkers and unsound bodies. Yet the prison regime seems to prevent the evil seeds which have been sown from germinating abundantly. Similar experiences have been related of workhouses, and many old people who have chosen to quit them have very soon succumbed to common influences outside.

Asylums contain an excessive number of persons who have inherited or acquired constitutional weaknesses, and in many cases tendencies towards consumption or cancer; also many alcoholics who are prone to these maladies. Yet the habits and rule of these institutions reduce the cancer rate much below the rate of the classes from which they were drawn, and below the rate both of occupied and unoccupied persons.†

Cancer in the Petroleum Industry

Numerous references to cancer and non-malignant skin eruptions among men in certain trades occur in the treatise on "Industrial Poisoning," by Dr. J. Rambousek, published in London in 1913. In connection with a discussion of the petroleum industry it is pointed out that

The occurrence of skin affections in the naphtha industry has been noted by several observers, especially among those employed on the unpurified mineral oils. Eruptions on the skin from pressing out the paraffin and papillomata (warty growths) in workers cleaning out the stills are referred to by many writers,‡ Ogston in particular.

Recent literature refers to the occurrence of petroleum eczema in a firebrick and cement factory. The workers affected had to remove the bricks from moulds on to which petroleum oil dropped. An eczematous condition was produced on the inner surface of the hands, necessitating abstention from work. The pustular eczema in those employed only a short time in pressing paraffin in the refineries of naphtha factories is referred to as a frequent occurrence. Practically all the workers in three refineries in the district of Czernowitz were affected. The view that it is due to insufficient care in washing is supported by the report of the factory inspector in Rouen, that with greater attention in this matter on the part of the workers marked diminution in its occurrence followed.

*The true cause of the difference is probably the non-use on the continent of the English method of chimney-sweeping.

†The large majority of persons in prison are, of course, below the age period of life when cancer is most frequent. According to a special investigation, made by me for the purpose, it was found that out of 309 deaths from all causes in American State Prisons during 1914 there were only 4 deaths from cancer, or 1.1 per cent.

‡Mitchell, *Medical News*, Vol. iii, p. 152; Annalise d'Hygiene public. Vol. xxiv, p. 500; Arlidge, "Diseases of Occupation"; Revue d'Hygiene, 1895, p. 166; Neisser, Intern. Uebers. f. Gew.-Hyg., 1907, p. 96.

In connection with the coal-tar industry it is said:

Workers coming into contact with tar suffer from an inflammatory affection of the skin, so-called tar eczema, which occasionally takes on a cancerous (epithelioma) nature similar to chimney-sweeps' cancer, having its seat predominantly on the scrotum. In lampblack workers who tread down the soot in receptacles the malady has been observed to affect the lower extremities and especially the toes.

With reference to the aniline-dye industry it is stated that

In 1903 a worker employed for eleven and a half years in the aniline department died of cancer of the bladder. Such cancerous tumors have for some years been not infrequently observed in aniline workers, and operations for their removal performed. Leymann thinks it very probable that the affection is set up, or its origin favored, by aniline. This view must be accepted, and the disease regarded as of industrial origin.

The frequency of tumors of the bladder among aniline-workers is briefly described in connection with the coal-tar industry as follows:

The first observations on the subject were made by Rehn of Frankfurt, who operated in three cases. Bachfeld of Offenbach noticed, in sixty-three cases of aniline poisoning, bladder affections in sixteen. Seyberth described five cases of tumors of the bladder in workers with long duration of employment in aniline factories.* In the Höchst factory (and credit is due to the management for the step) every suspicious case is examined with the cystoscope. In 1904 this firm collected information from eighteen aniline factories which brought to light thirty-eight cases, of which eighteen ended fatally. Seventeen were operated on, and of these eleven were still alive, although in three there had been recurrence. Tumors were found mostly in persons employed with aniline, naphthylamine, and their homologues, but seven were in men employed with benzidine.

Relation of Cancer to Injuries

There is a brief discussion of occupational cancers in Greer's treatise on "Industrial Diseases and Accidents," published in London, 1909. The discussion is of exceptional interest in connection with the problem of workmen's compensation for industrial diseases and is therefore given in full:

Workers in certain trades appear to be prone to suffer from cancer, as in chimney-sweeps, tar, pitch, grease and paraffin workers; possibly bacon-curers (Oliver), aniline workers (Rehn). The relation of injury to the development of cancer has received a very great deal of attention, the result being that we are in a position to give to traumatism a place amongst the factors which influence the production of malignant growths. The real cause, though the object of numerous researches, has as yet baffled inquirers. At present we have a number of observations which go to prove that continued local irritation can determine the development of a malignant growth. We recognize under this head chimney-sweeps' cancer, tar cancer, clay-pipe cancer, X-ray cancer, etc. In this class of superficial cancers the relations of cause and effect are not widely apart. In the more deeply seated growths, especially those taking origin in muscle and bone, the sarcomata, we must admit that traumatism may play a causative part, though here the relationship is not quite so manifest. In this class the history is not usually that of continued irritation, but is the narrative of perhaps a single injury. If the deeply-situated organs, such as the lung, kidney, stomach, liver, intestines, etc., become affected with malignant disease, and there is an account of an accident, it is very necessary before accepting the disease as of traumatic origin that the records of the case should furnish evidence that the organ in question was damaged at the time of the accident. If a long interval of time separates the development of the tumor from the accident, these records should show a certain continuity and sequence in the symptoms and signs following the injury leading up to that period in which the growth is revealed. On the whole question of the traumatic origin of tumors, Sand is of opinion that to establish the relationship it is necessary that the accident should have caused local lesions, swelling, pains, etc., that the growth should develop in the organ involved directly or indirectly in the accident, that the growth should appear within between three weeks and a year for sarcoma (two to six months on an average), between six

*Münchener medizinische Wochenschrift, 1907.

weeks and five years (average one to two years) for cancer, between one month and ten years for glioma (malignant disease of nerve structures, brain, spinal cord and eye), between three weeks and two years for other tumors. The patient should not be the subject of tumors of the same class previous to the accident. The traumatic origin is more likely if the patient has been healthy up to the accident. Youth is against traumatic origin (save in sarcomata, which are more common in youth). Many authorities think that the tumors described as of traumatic origin are really latent, that is, that they are dormant until stimulated into activity by injury. On the point of aggravation of tumors by injury, Sand holds that this would be established under the following conditions: if the accident cause, directly or indirectly, a tear or a hæmorrhage, etc., in the growth; if new symptoms of a serious nature show themselves within four days of the injury; if the development of the tumor was not at such a stage that an increase in activity was impending. A direct or indirect traumatism may induce in a tumor a breaking-up, and thus favor the production of metastases (the diffusion of the disease into other parts of the body), but it would most probably take a considerable time for these to develop, and their relation to the injury would be difficult to establish. An injury can not originate a metastasis in the wounded part, but it may favor the more rapid development of an existing metastasis.

A question may arise as to whether in a state of general debility induced by an injury, the normal resistance of the body to the attacks of disease being thus diminished, malignant growths may evolve (apart from those which may properly be considered to have a relation to local trauma)? The answer to this question is, up to the present we have no scientific evidence to support the view that these growths arise under such circumstances.

The subject of chimney-sweeps' cancer is briefly referred to by the same authority:

Epithelioma of the scrotum in chimney-sweeps is believed to be due to the long-continued irritation caused by the constant presence of soot on the part. The disease gives evidence of its maturity by the appearance of warty growths, which may remain quiescent or develop into ulcers. These ulcers progress and destroy the whole scrotum (purse). The glands in the groin become infected, and are eventually open, putrefying sores. The disease may ulcerate into the femoral or external iliac arteries and cause fatal hæmorrhage. The disease is curable by early operative removal.

Relation between Trauma and Tumor Formation

The entire subject of malignant growths following injury, with special reference to claims arising from the result of such injuries, is discussed by Magruder in a treatise published in 1910.* The evidence presented is largely in the negative. He quotes Cohnheim to the effect that the "Statistics concerning the relationship between trauma and tumor formation are not convincing, as the tendency is too deeply rooted in the human mind to associate a local ailment with a local cause." He also quotes Williams, writing in the *Twentieth Century Practice of Medicine*, in the statement that "Those who maintain that cancers are commonly caused by traumata, must explain how it is that men, who suffer three times as often from traumata as women, are, nevertheless, only about half as liable to cancers." This conclusion of Williams, however, would hardly seem warranted, since the fact is overlooked that the excess in cancer frequency among women is almost exclusively confined to the generative organs and the breast. Magruder quotes Sir Thomas Oliver's suggestion that "in all cases of alleged traumatic cancer leading to a fatal termination, a post-mortem examination should be made in order to ascertain whether what is apparent on the surface of the body is the primary or secondary growth."

*"Claims Arising from Results of Personal Injuries," W. Edward Magruder, M. D., The Spectator Company, New York, 1910.

CANCER AND OCCUPATION

Blast-furnace Pitch and Cancer

The subject of blast-furnace pitch and cancer is briefly referred to in *'he British Medical Journal* of August 19, 1911:

Mr. Perkins asked the Home Secretary whether, in view of the fact that the spread of ıncer among workers with pitch was attributed to the anthracene contained in tar and .tch derived from gas works, whereas tar and pitch derived from blast-furnaces were free om anthracene, he would take this fact into consideration in the new Home Office regulaons. Mr. Churchill replied that the fact that blast-furnace pitch was much less liable to .ve rise to cancer was already recognized in the draft regulations, which had been issued y the Home Office, for the manufacture of patent fuel (briquettes) with the addition of itch. Factories and workshops in which no pitch other than blast-furnace pitch was sed were specifically exempted from the regulations. It was not, however, certain that nthracene was the constituent of ordinary pitch to which the prevalence of cancer in the ıdustry was due.

Malignant Disease of the Lungs in Miners

An important contribution to the rather obscure subject of malignant lisease of the lungs in the miners of the Schneeberg district of Saxony ccurs in the *Journal of the American Medical Association,* under date f June 28, 1913:

Arnstein calls attention anew to the remarkable prevalence of malignant disease of the ings in the miners in the Schneeberg district in Saxony. The minerals mined are mostly obalt, bismuth and nickel. In 1878 Härting and Hesse reported that a lymphosarcoma f the bronchial lymph-nodes or an endothelial sarcoma was responsible for 75 per cent. f all the deaths among the miners. Arnstein has been investigating the subject anew and ound that one-third of all the miners admitted to the hospital 1907-1911 entered with the iagnosis of cancer of the lung, and it was given as the cause of death in 44 per cent. of the leath certificates. It is probable that in many cases tuberculosis and possibly also pneuoconiosis may have been erroneously diagnosed as cancer of the lung as necropsies are are. The local mining industry is declining, and Arnstein urges more extensive study of he subject while there is still material for it. In the two cases which he was able to ex.mine post mortem, the trouble proved to be chronic pulmonary tuberculosis in one case, ut in the other true carcinoma of the lung with metastasis.

Cancer among Tar and Paraffin Workers

The following observations on occupational cancers are from an address ın "Occupational Diseases," by Dr. W. Gilman Thompson, published n the *Medical Record,* New York, February 3, 1912:

Tar and paraffin workers develop a similar eruption which may last several months and hen change to the so-called "tar itch." This is accompanied by hyperkeratosis and inreased activity of the sebaceous glands, forming plaques and crusts, with the further levelopment of multiple warts, one or more of which degenerate into malignant growths. The disease affects chiefly the hands, forearms, and scrotum. It progresses slowly and in nany instances no recurrence takes place after removal of the epithelioma. Oliver cites he case of a man aged 58 who had worked among coal-oil and tar products for thirty years. Ie presented numerous indurated patches, some of which had ulcerated, as well as multiple lack warts and scars, the remains of old ulcers. His son, 27 years old, following the same mployment, developed a malignant growth of the forearm which necessitated amputation. Metastases of the axillary and cervical lymph-nodes took place, the patient succumbing to econdary carcinosis.

Cancer in chimney-sweeps has been reported chiefly from England. The soot produces ı chronic irritation of the skin and when retained in such regions as the folds of the scrotum auses warty growths which become epitheliomatous. In some instances the hands, arms, ınd thighs have been involved. The incidence of scrotal cancer has been markedly educed by the use of machinery to clean chimneys. It is reported that gardeners who mploy soot for the protection of plants from slugs similarly show the effects of this irritant in the development of malignant growths of the hands.

Comparative Mortality from Cancer among Chimney-sweeps

Arlidge, in his work on "The Hygiene, Diseases and Mortality of Occupations," published in London in 1892, observes regarding chimney-sweeps' cancer:*

> But the disease, par eminence, attaching to their calling is epithelial cancer. Dr. Ogle discovered, from his statistics, that "of 242 deaths of chimney-sweeps, no less than forty-nine were due to some form of malignant disease. This gives 202 deaths from this cause to 1,000 deaths from all causes; whereas the proportion of deaths from malignant disease to deaths from all causes, among all males from 25 to 65 years of age in England and Wales, is only 36 in 1,000; so that, even if the total mortality of sweeps were simply equal to that of all males, their mortality from malignant disease would be more than five times as much as the average. But the mortality of chimney-sweeps . . . is 50 per cent. higher than the average, so that the liability of chimney-sweeps to malignant disease is about eight times as great as the average liability for all males. These figures scarcely support the belief expressed by some authorities that improvements in the art and habits of sweeps have caused this disease to be comparatively infrequent among them." Of the forty-nine cases of deaths by cancer returned, the scrotum and adjacent parts were the seat of the lesion in twenty-three; in thirteen the organ affected was not stated; but in seven of them the malady was in internal organs, and the rest in the face, hip, orbit, palate, or neck. The consoling belief that sweeps' cancer is becoming a scarce phenomenon, since the application of the special Acts of Parliament controlling their work, is also somewhat rudely shaken by Mr. Butlin, of St. Bartholomew's Hospital, who, in his work on cancer, affirms that numerous instances are to be met with.

Cancer Frequency in Gardening and Agriculture

An important reference to cancer as an occupational disease among gardeners occurs in the treatise on "Industrial Diseases," by Weyl, published in 1908.† This discussion refers particularly to market gardeners, and apparently leans towards the view that cancer is an infectious disease and transmitted to gardeners in connection with the handling of infected earth or water, as the case may be. There is also a reference in this discussion to the proportionate mortality from cancer among men employed in different occupations in the city of Berlin during the two years 1897-99, the percentage of cancer deaths in the mortality from all causes having been as follows: Printers, 3.18, chemical industry, 3.85, miners and stone-workers, 4.65, metal-workers, 5.08, machinists, 5.69, paper and leather industry, 6.18, wood-working industries, 6.45, commercial occupations, including insurance, 6.81, building, 6.96, clothing industry, 7.45, textile industry, 7.49, food industries, 7.67, transportation industries, 8.08, shipping, 9.07, gardeners, 11.25, agriculture, 25.03. It is pointed out in this connection that in gardening and agriculture, respectively, 35.3 per cent. and 33.4 per cent. of the population are above age 40; but it is observed that this percentage is exceeded in many of the occupations in which the proportionate mortality from cancer is considerably less.

Reference is also made in this work to the report of the German Committee on Cancer Research, on the basis of the cancer census of October 15, 1900. The proportion of patients suffering from cancer of the skin was found to be exceptionally large among agricultural workers, and the conclusion is advanced that this was the result of contact with infected earth. Mention is made of the rather interesting fact that the

*An extended historical discussion of chimney-sweeps' cancer occurs in the chapter on chronic irritation, etc., in J. Wolff's treatise on Cancer, Vol. ii, p. 141, *et seq.*

†"Handbuch der Arbeiterkrankheiten," Dr. Theodor Weyl, Jena, 1908, p. 625.

old garden city of Erfurt, with a constantly diminishing mortality from all causes, had experienced a constant increase in the mortality from cancer. The rate per 10,000 living increased from 5.6 for the period 1880-84 gradually to 9.8 during the five years ending with 1904.* It was held, however, that this increase could not be connected with employment in gardening or truck-farming.

Cancer in Animals and Plants

In the study of the occupational incidence of cancer the possible parasitical origin of the disease requires consideration. The subject has been quite carefully investigated by C. E. Green in his treatise on "The Cancer Problem: A Statistical Study," published in Edinburgh in 1911. Green has raised the question as to whether there are any conditions in the trades showing the highest cancer death rates which would encourage the growth of a parasite akin to the myxomycetes, which are of doubtful relationship either to animals or to plants. He tries to connect the cancerous growth in plants with the corresponding growth in the human body and in this connection points out that

> Agriculturists, however, have suffered severely from the ravages of Plasmodiophora and one fact in particular is given in agricultural text-books as the result of their practical experience, viz., that whenever manures are used which have been *dissolved in sulphuric acid* the disease is almost certain to occur. This fact seems very important. Of its accuracy there can be no doubt, since the Board of Agriculture goes so far as to distribute leaflets gratis all over the country warning farmers that manures dissolved in sulphuric acid have a marked tendency to encourage the disease.

Coal-soot as a Cause of Cancer

Green, therefore, concludes that such manures have a stimulating effect upon the plasmodiophora and that cancer is of exceptional frequency in occupations which encourage the growth of a possible cancer parasite under the conditions stated. He does not accept the mechanical irritant theory as entirely conclusive, but he inclines to the belief, with special reference to chimney-sweeping and similar occupations, "that soot, or some product of combustion, is an active agent." He, therefore, holds that

> Ordinary coal soot has a deleterious effect upon the leaves of plants, and this was formerly ascribed to mechanical irritation or to the blocking of the stomata through which the plants breathe. Stockhardt, however, proved this to be wrong by an experiment, eighty-six times repeated, in which he filled a glasshouse with an atmosphere of soot from burnt benzine so thick that the contours of the plants could not be seen, and that the leaves were almost black. No disturbance of growth could be detected, and the leaves were afterwards as fresh as those outside. The pure carbon soot from the benzine had no effect, while coal soot had.

For the same reasons he argues that the carbon in coal does not cause cancer in miners, which seems to be fairly well established by the available statistics. In continuation of his interesting argument Green remarks:

> The fact that coal soot has some relation to the sweeps' high mortality is also, I think, indicated by the part of the body chiefly affected, as shown by a table in the Registrar's latest report. This table shows that in 30 per cent. of the deaths the scrotum and its adjacent parts are those affected. Now, the face of a working sweep will always be found to be covered with light powdery soot, while his hands and nails are absolutely black and coated. The extremities are not liable to malignant disease, but these soot-ingrained hands must for obvious reasons several times in a working day come in contact with the

*The cancer death rate in Erfurt in 1910 was 12.0 per 10,000 of population.

susceptible parts which are associated with "sweeps' cancer." If soot, then, be an active agent in producing malignant disease, as is shown by the appalling mortality among chimney-sweeps and by other indications, while coal-dust has no effect upon the coal-miner, it is obviously of importance to consider what soot contains which coal does not.

Green explains in this connection that coal-soot is chiefly composed of finely divided carbon, but that it contains also a considerable proportion of sulphate of ammonia; and further, that since coal contains sulphur and nitrogen, sulphurous acid is evolved in the process of combustion, which combines to form sulphate of ammonia, the existence of which in large quantities in soot has led to its extensive use as a fertilizer by farmers and gardeners.*

Paraffin-workers

Perplexed by the apparent difficulty that in sulphate of ammonia, or the sulphurous acid which goes to compose it, is a causative factor, it was difficult to explain how paraffin had induced cancerous growths among paraffin-workers in several well-authenticated cases. The question confronting him was to ascertain whether there was anything in common between commercial paraffin and soot. He observes with reference thereto:

When we examine the practical methods of paraffin refining we find that in order to remove the oily bases it has been found in practice that an acid treatment of the finished oil is necessary. It is not possible to remove the whole of these bases by one or even two acid treatments, but the oil must be *shaken up with acids a number of times.* All kinds of acids have been tried, but the results of numerous experiments have proved *sulphuric acid* to be the only one suitable for this work. It is specially pointed out in Redwood's *Mineral Oils* as of the utmost importance that all such sulphuric acid treated oils must be allowed to settle until as thoroughly freed from this acid tar as possible.

In removing the impurities the sulphuric acid must form various sulpho-acids which must frequently be present in the paraffin after the operation. It would be a difficult matter to say what were the sulpho-acids, as there might be, of course, fifty different varieties, entirely depending on what the impurities were. There would certainly be no sulpho-acids of the paraffin itself, as this remains unacted on, and it is only impurities that are acted on.

One impurity which is bound to exist, however, is ammonia—since the method of separation of ammonia water from the crude oil is a very rough and ready one—and we are driven to the result that even *in refined paraffin, as in soot, sulphate of ammonia and sulpho-acids must often exist.*

Brewers

These extracts have been given in full, since they are not only of interest in connection with the subject under consideration but also as an indication of the direction which scientific inquiries of this kind are bound to take. The conclusions by Green are apparently confirmed by his subsequent investigations, and particularly with reference to *brewers*, who exhibit a high mortality figure from cancer and who in a branch of their work are exposed to the effects of soot accumulations. Additionally thereto the brewer is said to be exposed in the constant handling of "sulphured" hops, the sulphur being used for bleaching purposes.

*There is a brief reference to cancer in one of the papers on the "Influence of Smoke on Health," published by the Mellon Institute of Industrial Research, Pittsburgh, Pa., 1914. After restating the generally accepted view that "soot has for many years been more or less fancifully believed to create a predisposition towards the production of cancerous growth among workmen who are brought into contact with it" and an extended reference to recent observations by Sir Thomas Oliver, the report concludes that "it is scarcely conceivable that the amount of soot in the air of industrial towns is sufficient in amount to be an exciting cause of cancer, as it might possibly be in the case of chimney-sweeps." (See, however, discussion of chemical industry, page 65.)

Furriers and Skinners

With special reference to *furriers and skinners*, Green calls attention to the instructive fact that these occupations rank high in the mortality from cancer, while tanners invariably rank very low. The cause, he explains, must naturally be due to some essential differences in the method of preparing skins for furs and for leather. The facts are not fully set forth, but apparently the irritant is the sulphuric acid contained in the alum used for skin-preserving purposes. He remarks that nearly all furs have to be dyed, and that the mordant used is chiefly sulphuric acid.

Seamen

Concerning *seamen* it is said:

Seamen have shown a great increase in their cancer mortality, due apparently to the increase of steamers and the decrease of sailing ships. The fact that they have a higher mortality figure than fishermen seems to me to be due to this and to their stuffy and smoky quarters. Fishermen do not so often sleep on board; indeed, the greater number never do.

Tinplate-workers

Concerning *tinplate manufacture* he observes:

What element in the manufacture of tinplate can cause this very high mortality figure? If my theory is correct, this would explain it: "Before 'tinning,' the plates are called black plates. When the iron has been cut to the required size the plates are 'pickled,' i. e., they are immersed in hot sulphuric acid."

Lead-workers

Also with reference to *lead-workers* the observations are of special interest:

Here we have a close connection with sulphurous acid. It is pointed out in the last report of the Registrar-General that the mortality of lead-workers had decreased since 1890. Now, until recent years only a small quantity of lead was obtained from any other ore than galena, which is a sulphide of lead. When galena is smelted, much of the sulphur goes to form sulphurous acid, which escapes as a gas. There remain in the hearth of the furnace oxide, sulphate, and sulphide of lead, which react upon each other, forming sulphurous acid and metallic lead.

Rubber-workers

And concerning *India rubber-workers:*

The connection here is at first sight obscure, but the fact remains that alum and sulphuric acid are constantly used to effect the coagulation of the juice, and it is pointed out in the Encyclopedia Britannica (India rubber) that traces of these remaining in the rubber constantly work mischief in it.

Chemical Industry

Green's treatise includes a brief discussion of the incidence of cancer in *chemical manufactures*, which, of course, include employments with an exceptional degree of exposure to sulphuric acid fumes, etc., and as regards general occupations in London, for which the mortality figure is above the average, he explains that this is probably due to the enormous amount of sulphurous acid in the atmosphere. He incidentally mentions the frequency of cancer among *guano-workers*, quoting from the new edition of *Bryant and Buck's Surgery*, the occurrence being attributed to the fact that since the rich deposits have been largely worked out the stores now drawn upon are, in many cases, compact and rocky in texture, and require to be disintegrated and treated with sulphuric acid. He therefore concludes that "if sulphurous acid or sulpho-acids

have no connection with cancer I have stumbled across an extraordinary series of coincidences."

X-ray Workers and X-ray Dermatitis

Perhaps no problem in occupational cancer has attracted more attention than X-ray carcinoma. An analysis of forty-seven cases is presented by Dr. C. A. Porter, of the Harvard Medical School, in the Fifth Report of the Cancer Commission of Harvard University. The following brief observations are from this important contribution to the subject:

> Though the harmful results of continuous exposure to the X-rays were unknown to the early workers in this field, it would seem that unwittingly they have given us the best demonstration yet known of the artificial or experimental production of cancer. It is unlikely that old age itself, with its accompanying skin atrophics, even if combined with exposure to such various noxious influences as sea life, raw winds, powerful actinic rays, soot or paraffin, would give such an example of malignant skin degeneration as seems so frequently to result from protracted exposure to the X-ray. When it is remembered that these lesions have been produced in young men at an age when skin cancer is extremely rare, its occurrence is all the more striking.

Regarding an apparently effective method of protection for *X-ray workers* it is said:

> An accidental discovery in the case of J. G., Case XVIII., seems to show the value of protection during the early years of work, and the lack of harmful influence to recent exposures with proper precautions. A broad gold ring was worn during the first two years of work on the ring finger of the left hand. This was subsequently removed. The whole dorsum of the hand shows the characteristic changes, while the skin protected by the ring remains to this day perfectly normal. The immunity which even light clothing offers is shown by the rarity or slight degree of dermatitis above the cuffs, and in those parts of the body protected by clothing. It would seem, therefore, in view of this immunity from slight covering, that not the X-rays themselves, but other emanations from the tube are to be held chiefly responsible for the burns and the chronic dermatitis.

The subject attracted the attention of Green, who remarks:

> In this imperfect survey of the trade and occupational incidence of the disease I would venture to make a suggestion regarding what is called X-ray cancer, which so commonly follows a dermatitis on the hands of X-ray workers. It is certainly one of the most puzzling aspects of the whole cancer problem that X-rays should cure rodent ulcer and yet induce epithelioma on the fingers of the operators of these rays. If, as stated before, the plasmodia of myxomycetes are killed by exposure to light of moderate intensity, it is quite intelligible that X-rays should cure cancer, but quite unintelligible that they should cause it.
>
> The X-rays admittedly cause a dermatitis and thereby diminish the resistance of the epithelium. It should not be forgotten, however, that most X-ray operators have to prepare many skiagraphs and to develop negatives. This, in my opinion, is the cause. Fixing plates by means of hypo-sulphite with fingers, the skin resistance of which is already weakened, is much more likely to cause the epithelioma than the rays themselves. These would only indirectly be concerned.

As bearing upon the protective means suggested by Dr. Porter it appears that Dr. Menard, director of the radiography section of the Cochin Hospital, has devised a glove which will avert all danger to the operating physician when using the X-ray. It would carry this discussion entirely too far to review in detail the not inconsiderable evidence of Roentgen-ray injuries, with reference, of course, to cancer growth. The risk, no doubt, is especially great in the manufacture of X-ray apparatus, and particularly X-ray tubes. The subject has been discussed under the title "Roentgen-rays and Dermatitis," by Sir Thomas Oliver in his evidence (Q. 10,625), before the Committee on Industrial Diseases.

n view of the obvious risk to X-ray workers, the following extract rom the *Medical Record* of August 8, 1903, is included:

G. Holzknecht and R. Grünfeld have devised a protective covering for the skin for use uring the application of the Roentgen rays. It consists of a sheet of tin which is covered n both sides with a thin layer of hard rubber. The plate thus made may be of any size nd shape desired and perforated by as many apertures as wished. It is very flexible and ay be easily adapted to the various curvatures, etc., of the body. It is light and easy to andle, and may be sterilized, washed, or heated without damage. Its extended use ows that it affords a complete protection to the healthy skin from the burning and other nnoyances which frequently attend the application of the Roentgen rays.

Among the more suggestive cases of fatal injuries from X-ray exposure in the medical profession a brief reference may be made to the leath of Dr. B. E. Baker, of Hartford, who died from injuries due to xposure to the X-rays in the course of experimental work in 1913.

The *Medical Record* of March 29, 1913, quoting from the *Journal for nsurance Medicine** notes the case of an electrician as follows:

The electrician was employed for fifteen years in the X-ray room of an orthopedic linic and had suffered from a chronic affection of the skin of the hands and face resulting rom constant exposure to the rays. He was finally incapacitated, and applied to his trade nion for the indemnity for accidental injury during employment. The union refused uch indemnity, stating that the injury complained of was not due to any accident, but was eally an occupational disease, not to be indemnified according to the terms of insurance. n appeal to the courts was decided in favor of the union's interpretation of the agreement.

The *Medical Record* also, under date of April 5, 1913, cites the case of he death of Dr. Charles Lester Leonard, professor of Roentgenology n the Philadelphia Polyclinic and College for Graduates in Medicine, nd one of the pioneers in this special field of work. Dr. Leonard some ears ago first lost several fingers from one hand, and later on the ntire hand was sacrificed, it being subsequently found necessary to emove the forearm so as to check the advancing effects of the X-ray urns.

Radio-active Substances and Cancer

The study of radio-active substances in their relation to cancer and ccupation offers a field of considerable promise. The admirable exerimental inquiry by Lazarus-Barlow suggests results of considerable ractical value. With regard to substances commonly supposed to be ausally related to carcinoma, this author states that

Numerous samples of clay pipe, soot, pitch, paraffin wax, metallic arsenic, arsenious xide, betel nut, cholesterin gall stones, pigment gall stones, renal and vesical calculi, have een examined skotographically, the calculi, renal, biliary, and vesical, being made the ubject of an extended research by Dr. Colwell. Skotographic effect was exhibited by one ample of soot out of two examined, by betel nut on all of numerous occasions, by each f twenty-three specimens of cholesterin gall stones, more or less "pure," in three out of ur samples of pigment gall stones examined, the effect being always very slight as comared with the action of the cholesterin calculi, and by thirty out of thirty-eight vesical lculi. Metallic arsenic and arsenious oxide produced effects upon the photographic lates, but inasmuch as the films showed alteration before development the action cannot e regarded as skotographic. On the other hand, none of nine specimens of clay pipe, of umerous samples of paraffin wax, of four samples of pitch from different localities, of everal specimens of coal, yielded the slightest trace of skotographic action.†

Even though the evidence was negative, it would seem well worth hile to carry on further experimental research along the lines suggested.

*Zeitschrift für Versicherungs Medizin, Vol. v, No. 12.
†*The British Medical Journal*, June 19, 1909.

Cancer and Exposure to Light

The relatively high frequency of cancer among seamen and fishermen would seem to support the theory advanced by Wilfred Watkins Pitchford, M. D., Government Pathologist of Natal, in an address on Light Pigmentation and New Growth, in which the view is advanced that

> The increase of cancer within the last seventy-five years is perhaps due to the diminished protection from light and increased exposure to illumination. Woolen garments have been largely replaced by cotton, and black and brown clothes by those of a light color. Narrow streets and dark houses are no longer tolerated and suburban life has largely replaced that of the city. Artificial light has become more actinic in its character.

He further concludes, as a manifest deduction from the foregoing principles, that cancer may be prevented by efficient protection of the body from light and that natural protection, such as hair upon the face, should be encouraged. The clothing should be absolutely light-proof. The ventral surface of the thorax and abdomen should be especially protected. Considering the almost universal non-protection of the upper chest of many women at the present time, the conclusion of this author to the effect that "Mammary cancer in women is usually due to insufficient protection of the breast from light" may be quoted as a word of warning. The theory of Dr. Pitchford also suggests an explanation, at least in part, why the dark-skinned races should apparently be so much less liable to malignant disease than the white races living in tropical or non-tropical countries. The author's complex and involved theory which underlies the practical application of the principles of actinic therapy can not be discussed in detail.*

The Synthetic-dye Industry

The foregoing discussion is but an inadequate outline of an important branch of industrial medicine. The subject is as yet in its initial stage and few really substantial contributions have been made to the scientific study of the facts. What may be considered a classical contribution to the problem is an essay on the effect of the synthetic-dye industry on the occurrence of tumors, by Dr. S. G. Leuenberger of Zurich, published in the Contributions to Clinical Surgery for 1912.† The thoroughness of this investigation is best emphasized in the statement that the literature cited includes 318 titles. There can be no question of doubt that further specialized cancer research in conformity to this method and particularly in the chemical trades would yield exceptionally useful results. Another valuable contribution to the same subject is an extended discussion of the so-called Schneeberg carcinoma of the lung, by Alfred Arnstein of Vienna, first described by Härting and Hesse in 1878-79. This form of cancerous growth, as previously pointed out, occurs among miners in the Schneeberg District of Saxony, the minerals mined being nickel, cobalt and bismuth. The disease is considered to be exceptionally common where, in damp shafts, there are extensive growths of vegetable molds, which fact, suggests a possible application in the present case of the theory advanced by Green

* "Light, Pigmentation and New Growth," by Wilfred Watkins Pitchford, M. D., F. R. C. S., Natal, *The British Medical Journal*, August 21, 1909.

† "Die unter dem Einfluss der synthetischen Farbenindustrie beobachtete Geschwulstentwicklung," by Dr. S. G. Leuenberger *Beiträge zur Klinischen Chirurgie*, Tübingen, 1912.

of Edinburgh, elsewhere discussed in this section. The dissertation by Arnstein was first delivered before the German Pathological Society in 1913, and printed in full in the *Clinical Weekly* of Vienna, under date of May 8, 1913.*

Finally, a brief reference requires to be made to the extended discussion of pitch ulceration and chimney-sweeps' cancer, etc., in the report of the Departmental Committee on Industrial Diseases (1907), which includes a reprint of the comparative cancer occupation mortality tables for England and Wales.

The Tinplate Industry

Quite recently an investigation has been made into the frequency of cancerous complaints among persons employed in the manufacture of tinplates, and a brief reference thereto occurs in a report on the "Process of Tinning," published by the Factory Inspection Department of the United Kingdom in 1912. The reference reads:

> The danger of long standing indigestion, which indicates a chronic inflammatory condition of the gastro-intestinal tract cannot be overlooked; moreover, Victor Bonney expressed the opinion that the onset of carcinoma is constantly preceded by certain chronic inflammatory changes; and such evidence as is obtainable goes to show that tinhouse operatives die in excess from gastro-intestinal disease, of which cancer is the chief.

The subject was further investigated by the laboratories of the John Howard McFadden Research Fund of the Lister Institute of Preventive Medicine. In a joint report on the results of an investigation of the chronic irritation caused by fumes and dust produced in the process of manufacturing tinplate, by Messrs. Ross and Cropper, published in *The Lancet* under date of August 9, 1913, it is stated that

> In the process of tinning fumes are given off which have a powerful irritating effect on the mucous membrane, and it is with a view to finding out whether these fumes contain auxetics and kinetics that this research has been undertaken. At the pitch works the pathological lesions are confined to the eyes and skin, but in the tinplate works the skin remains unaffected, and it is only in the naso-pharyngeal and alimentary passages that the irritation is felt.

The technique and the details of the experiments are briefly described in the article, but more fully in the report previously referred to on the problem of gas-works and pitch industries and cancer, published by the same Fund in 1912. Apparently cancerous lesions are produced by irritating fumes and dust in the tinplate industry in much the same manner and to much the same extent, perhaps, as in the manufacture of artificial fuel briquettes. The results of the investigation were not entirely conclusive, but in the meantime it was considered advisable to suggest methods and means tending to alleviate the conditions at the tinplate-works. It was therefore proposed by the authors that a substitute or substitutes should be employed for the palm oil used, such as mineral oil or wax or any suitable substance which would be auxetic-free, and which when mixed under the industrial conditions with a flux would continue to be auxetic-free. It was suggested that a suitable substitute be tried for the flux, or it may be found more practicable to treat the palm oil or flux, or both, by re-agents in order to oxidize the auxetics or to fix them by the Sorenson reaction. Further, it may be advisable to separate the stages of the process of tinning by suitable covering of the various parts of the process or by isolating the workmen.

*"Ueber den sogenannten 'Schneeberger Lungenkrebs'," by Dr. Alfred Arnstein, *Wiener klinische Wochenschrift*, Wien, May 8, 1913.

In concluding these general observations on the occupational incidence of cancer, the following brief statement from "The Pathology of Growth," with special reference to tumors, by Charles Powell White, published in New York, 1913, is of interest:

> Chemical substances derived from the outside in the course of various occupations may play a part in cancer causation. Workers in soot, tar, paraffin, and the like sometimes develop carcinoma of the skin, which must apparently be attributed to their occupation. In the case of chimney-sweeps the usual seat of the tumor is the scrotum. Tar and paraffin workers may develop carcinoma of the scrotum or of the arms or other parts. Arsenic may give rise to a chronic eczema which may be followed by carcinoma. Workers in certain nickel and cobalt mines are said to be liable to lymphocytoma of the mediastinum, and workers in dye works where aniline is largely used are liable to cancer of the bladder.

The evidence brought together would seem to be quite sufficient to sustain the conclusion that the occupational incidence of cancer is an important phase of the larger problem of cancer frequency and that specialized investigations in this direction are quite likely to yield results of far-reaching practical importance.

Statistics of Cancer in Relation to Occupation

The most useful statistical data regarding the occupational incidence of cancer are those published at decennial intervals in the supplement to the annual report of the Registrar-General for England and Wales. The statistics for the two three-year periods ending with 1892 and 1902 have been brought together in a convenient form for the principal occupations in the tables appended to this discussion. The data for the three years ending with 1912 will not be available for several years. Tables 1 to 5, inclusive, in Appendix C, give the number of persons employed in particular groups of occupations, or, more accurately, the total number of years of life exposed to risk. The actual number of persons considered is in each case approximately one-third of the number of years of life for the three-year period. The tables also give the total number of deaths from cancer during the three-year period and the cancer death rates calculated on a uniform basis of 100,000 of population. The titles of the tables in Appendix C, including the occupation mortality statistics of The Prudential are given below:

Table 1—Mortality from Cancer in England and Wales, in selected occupations, according to age, males, 1890-92.

Table 2—Mortality from Cancer in England and Wales, in selected occupations, according to age, males, 1900-02.

Table 3—Mortality from Cancer in England and Wales, in selected occupations, males, crude and standardized death rates, ages 15 and over, 1890-92.

Table 4—Mortality from Cancer in England and Wales, in selected occupations, males, crude and standardized death rates, ages 15 and over, 1900-02.

Table 5—Mortality from Cancer in England and Wales, in selected occupations, males, ages 15 and over, standardized death rates, 1890-92, compared with 1900-02.

Table 6—Industrial experience of The Prudential Insurance Company of America, Mortality from Cancer, by occupation, ages 35 and over, males, 1907-12.

Table 7—Cases of Cancer in Hungary, by occupation, 1904.
Table 8—Mortality from Cancer in Hungary, by occupation, 1901-04.

English Mortality Statistics

On account of the limitations of space the following brief observations have reference only to the mortality from cancer in selected occupations, ages 15 and over, as determined by the crude and standardized death rates of England and Wales for the three years ending with 1902 (Table 4, Appendix C). Since the cancer death rate is invariably a function of age, it is obviously of the utmost practical importance that in the calculation of cancer mortality rates by occupation the age factor should, if possible, be taken into account. Some occupational groups include a much larger proportion of persons of the cancer age than others, as is, perhaps, best illustrated in the contrast of clergymen and persons employed in clerical occupations (bookkeepers, clerks and copyists). Among clergymen, according to the United States Census for 1900, the proportion living at ages 45 and over was 45.5 per cent., compared with a corresponding proportion for clerical occupations of only 14.1 per cent. The crude cancer death rates based upon occupational groups so fundamentally at variance with each other as regards age distribution are practically certain to be erroneous and, as a rule, seriously misleading. In the English experience for 1900-02, for illustration, the crude cancer death rate for clergymen was 163.1 per 100,000 of population, as compared with a rate of only 52.5 for school teachers. When, however, the required standardization is made for age, the rates for the two groups are brought into close conformity to each other, the rate being, for clergymen, 87.3, and for school teachers, 90.1. An equally striking result is obtained by means of the standardization for age in the cancer death rate of English railway engine-drivers and stokers, for which the crude death rate of 41.9 per 100,000 of population is increased to a standardized death rate of 85.3. When thus standardized for age, the relative incidence of cancer in different occupations becomes a reasonably trustworthy indication of the specific liability to cancer in certain employments, although a further correction for the organs and parts of the body affected would be necessary to establish the true causal relationship existing between specific employments and specific forms of malignant growth.

The table referred to (Table 4, Appendix C) shows, first, the recorded cancer death rate per 100,000 of population, second, the factor for standardization as determined by the variations in the age distribution of the different groups and, third, the resulting standardized death rate, which alone can be considered conclusive for the purpose of comparison. This table brings out the fact that the highest standardized cancer death rate occurred among chimney-sweeps, for which occupation the rate was 224.9 per 100,000 exposed to risk. The rate for seamen was 170.5, and for brewers, 166.6. Relatively high, but not abnormally excessive, cancer death rates are met with in the following occupations: fishermen, 111.9, tailors, 112.9, textile-workers, 112.6, lawyers, 111.8, innkeepers, 108.8, corn-millers, 105.3, gas-works service, 107.1, shoemakers, 103.2, and butchers, 102.8. Lower cancer death rates but still suggestive of special predisposing conditions are met with in the following occupations:

farmers and graziers, 94.8, farm laborers, 79.7, and gardeners and nurserymen, 85.2. In a general way the relative degree of occupational cancer frequency as disclosed by the analysis of the standardized death rates for 1900-02 is confirmed by the previous investigation for the three years ending with 1892 (Table 3, Appendix C). The wide variations in occupational conditions suggest the existence of causative factors rather than of a single cause as being responsible for the exceptional cancer frequency in certain occupations; but the most suggestive result of this analysis is the evidence of an unusually high mortality from malignant disease in three specific though widely different employments, namely, chimney-sweeps, seamen and brewers. It is equally suggestive that relatively high cancer death rates should have been experienced in more or less unrelated occupations, i. e., maltsters, fishermen and persons employed in the gas-works service. It is regrettable that these statistics should be so largely for groups of employments rather than for specific occupations. But this conclusion does not apply to the three principal employments with excessive cancer death rates, i. e., chimney-sweeps, seamen and brewers. It is quite probable that if certain employments in the gas-works service could have been separately considered, the cancer death rate of such a selected group would have been found to be much higher than that of the industry as a whole. The several tables in the Appendix are well-deserving of extended critical consideration. The English data are the most trustworthy and conclusive available for the present purpose, and the suggestion may be made that as far as practicable a corresponding analysis should be made of the occupation mortality data for the registration area of the United States on the basis of the occupation statistics of the thirteenth census.

Life Insurance Experience Data

The frequency of cancer according to occupation in the experience of life insurance companies has not been made the subject of a special study otherwise than as disclosed by the medical statistics of The Prudential Insurance Company of America, first exhibited on the occasion of the Fifteenth International Congress of Hygiene and Demography. It is regrettable that this experience could not have been correlated to the exposed to risk in different occupations, but such an extension of the statistical analysis could have been made only at considerable expense, without the assurance in advance that the practical results would be commensurate with the cost. The statistical tabulation is therefore limited to the deaths from cancer by occupations, ages 35 and over, correlated to the mortality from all causes at corresponding periods of life. This method of proportionate mortality analysis is of considerable practical usefulness. It is shown that the highest proportionate mortality from cancer, 12.32 per cent., was experienced among coal-dealers, followed by teachers, 11.35 per cent., editors and journalists, 9.90 per cent., laundrymen, 8.62 per cent., upholsterers, 8.44 per cent., gardeners, 8.43 per cent., brewers and maltsters, 5.78 per cent., clergymen, 8.00 per cent., engineers (not specified), 7.90 per cent., sawyers, 7.65 per cent., clothing-workers (tailors), 7.49 per cent., plasterers, 7.10 per cent.

Limitations of Occupational Mortality Statistics

These statistics are not conclusive and should be accepted with caution. They show, for illustration, that tanners, who in the English experience had a low mortality, had in the Prudential experience a comparative figure of 6.02 per cent., against 5.78 per cent. for brewers and maltsters. How far the element of medical selection affects these data is rather doubtful. The medical examination required for Industrial insurance purposes is generally not very thorough, but it would be apt to be more thorough in the case of brewers and maltsters, as well as in the case of persons otherwise connected with the ale, wine and liquor traffic, than of those not so employed. The statistical tables are, therefore, presented with some reluctance, and they are to be rather considered as a preliminary contribution towards a more scientific and thoroughly representative inquiry into the facts.* Thus far no cancer occupation mortality data derived from life insurance experience have concisely differentiated the organs and parts of the body affected. As brought out by the previous discussion, the possible local irritant responsible for cancer growth must necessarily be limited to the particular parts of the body more exposed than others, on account of special occupational activities. The frequency of cancer of the scrotum in chimney-sweeps and of cancer of the urinary organs in persons employed in the manufacture of aniline dyes suggest the practical value of a more specialized statistical investigation in this field.

Irritability and Cancer Causation

The foregoing brief discussion of an important phase of the cancer problem emphasizes the urgency of more extended occupational studies than have thus far been made. Cumulative evidence would tend to establish the truth or the falsity of prevailing opinion and, in any event, eliminate much misleading information. The fundamental concept of irritability as the direct or contributing cause of cancerous growth is apparently well sustained by occupational studies of the cancer problem.† All disease, it is held by the foremost author on irritability, or the effect of stimuli in living substances, "consists of the influence of stimuli upon these physiological processes." "Every disease," he maintains, "represents only a disturbance of the physiological processes of cell life of the organism and the harmony in their combined workings." Believing that the available evidence regarding cancer warrants the conclusion that malignant disease is not the result of a single cause, I can not do

*In this connection the following sources of information on cancer occupation mortality statistics should be consulted: Ueber den Einfluss von Beruf und Lebensstellung auf die Todesursachen in Halle, a. S., 1901-09. Recueil de Statistique Municipale de la ville de Paris, Dr. Jacques Bertillon, 1912. Ungarische Statistische Mitteilungen; Statistik der Krebskranken in den Ländern der Ungarischen Heiligen Krone, 1908. Bericht ueber die vom Komite für Krebsforschung am 15 Oktober, 1900, erhobene Sammelforschung, Jena, 1902. Das Vorkommen des Krebses in Baden, Dr. R. Werner. The morbidity and mortality experience of the Leipzig Communal Sick Fund, Berlin, 1910. Mortality Statistics, 1908-09, Division of Vital Statistics, Bureau of the United States Census.

†The technical aspects of the problem of causation or conditioning circumstances from the pathological point of view have been discussed by Gustav Heim in Virchow's Archiv., Vol. ccxvi, Berlin, 1914. The philosophical aspects of causation are fully discussed by Stanley Jevons in his "Principles of Science" (Vol. i, p. 254, *et seq.*), who observes that "the work of science consists in ascertaining the combination in which phenomena present themselves," which is precisely the object and proper use of the statistical method in cancer research. See also in this connection Pearson's "Grammar of Science" (2d edit., p. 113, *et seq.*), and John Stuart Mill's "Logic" (New York, 1891, 8th edit., p. 311), on "Plurality of Causes," who observes, *inter alia*, "It is not true that the same phenomenon is always produced by the same cause."

better than conclude by quoting the following most carefully considered remarks of Dr. Max Verworn, the author of a standard work on "Irritability":

Another point concerning the application of the conception of cause seems to me, however, to be of much more importance, namely, that a single cause is held responsible for the taking place of a process. One endeavors to explain a process in general by seeking for its "cause." The cause being found, the process is considered fully accounted for. This idea is not one widely spread in everyday life, but is found frequently in natural science, especially in biology, although here, it should be known, the processes are decidedly more complicated. The search for the "cause" of development, for the "cause" of heredity, for the "cause" of death, for the "cause" of the respiration, for the "cause" of the heart beat, for the "cause" of sleep, for the "cause" of disease, etc., was for a long time and frequently even to-day a characteristic of biological investigation. As if such a complicated process as development, death or disease could be explained by a single factor! In reality, one has obtained very little as a result of the analysis of a process by discovering its cause; and, in addition, the false impression arises that through the finding of this one factor the process has been definitely explained. It has been generally recognized in the natural sciences in recent times that no process in the world is dependent upon one single factor and attempts have been made to give this fact more consideration.

This conclusion applies with special force to the cancer problem and provides the best possible answer to the constantly recurring question as to the cause of cancer and its direct relation to the larger problem of prevention, treatment and control.*

Foreign Cancer Census Investigations

The scientific study of the occupational incidence of cancer has been attempted with more or less success by means of special cancer censuses, the results of which, however, as a rule, have not been correlated to the living population with a due regard to age and sex. These investigations can not be fully discussed here, but they are referred to briefly as an indication of the direction of research work, which is likely to prove of considerable practical value.

The German cancer census of 1902† presents the collected cancer cases, by occupations, according to sex, for the empire as a whole, and for the large cities separately, and also with reference to organs or parts of the body affected. The investigation considered only those suffering from the disease who were actively employed, or employable, or, in other words, persons in the advanced stage of the disease were apparently excluded. The table below gives the details for certain broad divisions of occupations, and while not conclusive, the facts are certainly suggestive.

Cancer in Germany, by Organs and Parts, according to Occupation, Males

Organ or Part	All Occupations	Agriculture	Textile Manufacture	Common Laborers	Retired	Metal Workers	Wood-working Industry	Transportation
Bones	25	21	19	21	20	30	41	23
Skin	150	250	99	140	163	90	110	112
Respiratory organs	20	7	19	16	24	30	21	14
Digestive organs	703	642	783	718	703	750	685	748
Urinary organs	15	8	..	10	45	30	13	5
Glands	59	54	53	56	28	35	96	70
Breast	4	1	..	2	4	15	13	9
Generative organs	24	17	27	37	13	20	21	19
Total	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000

*See discussion of Cancer in Selected Occupations, Bulletin of American Academy of Medicine, 1914.

†Bericht ueber die vom Komite für Krebsforschung am 15 Oktober, 1900, erhobene Sammelforschung, Jena, 1902.

Cancer in Germany, by Organs and Parts, according to Occupation, Females

Organ or Part	All Occupations	Agriculture	Textile Manufacture	Common Laborers	Retired	Restaurant, etc., Keepers	Laundresses	Domestic Service
Bones	11	18	10	11	10	..	8	20
Skin	73	151	52	95	88	..	116	81
Respiratory organs	3	..	5	4	..	..	..	..
Digestive organs	306	338	235	374	311	244	349	323
Urinary organs	6	4	10	4	4	..	..	10
Glands	55	73	26	54	38	122	16	61
Breast	243	208	287	154	374	220	240	111
Generative organs	303	208	375	304	175	414	271	394
Total	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000

As an illustration of the value of this method of statistical analysis the excessive relative incidence of cancer of the skin in agriculture may be referred to, the proportion among males having been 25 per cent. of all cancers, against only 9 per cent. for workers in the metallic industries and 11 per cent. for workers in the wood-working industries. The same pronounced differences regarding the incidence of cancer of the skin appear among female workers, the proportion for those in agriculture having been 15.1 per cent., against only 8.1 per cent. for domestic service. Tables of this kind, however, require to be standardized for variation in age distribution, which, unfortunately, is not possible on the basis of the data as derived from the German cancer census.*

The occupational incidence of cancer was also reported upon in the Hungarian cancer census, published in 1908.† This investigation is limited to males in specified industries correlated to the population as determined by the general census. The data are subjected to a check through a subsequent analysis of the cancer mortality by occupations for the period 1901-04.‡ The highest relative cancer figure was for day laborers, 13.66 cases per 10,000 employed, followed by butchers, with 11.57, and independent traders, with 9.27. In a general way, the data ascertained by the cancer census were confirmed by the mortality analysis, but there are important variations, due, no doubt, largely to the varying age distribution of the different occupational groups, which unfortunately could not be taken into account. As an illustration of the relative incidence of cancer in the more important groups of occupations, it may be pointed out that while day laborers experienced a cancer morbidity rate of 13.66 per 10,000, the corresponding rate for the mining industry was only 3.37, and for agriculture, 1.74. As brought out by the mortality analysis, day laborers experienced a rate of 8.66 per 10,000, the mining industry, 4.81, and agriculture, 4.59. These differences are so pronounced that they warrant the conclusion that really useful and conclusive investigations into the occupation incidence of cancer require to be made with a due regard to the age distribution of the

*The experience data of the Leipzig Communal Sick Fund are valuable for general purposes, but hardly conclusive regarding the comparative incidence of cancer in different occupations. For all compulsorily insured males the cancer death rate per 100,000 of population at ages 15-24 was 1.1; at ages 25-34, 3.4; at ages 35-44, 23.1; at ages 45-54, 100.1; at ages 55-64, 215.7; at ages 65-74, 375.5; and at all ages, 24.4. For those insured voluntarily the rates throughout were much higher, and for all ages combined the mortality was 196.6. For females the numbers exposed to risk are much less and the data are obviously inconclusive.

†Statistik der Krebskranken in den Ländern der Ungarischen Heiligen Krone, Budapest, 1908.

‡Tables 7 and 8, Appendix C.

persons employed and the organs and parts of the body affected by cancerous growths. The incidence of cancer among women, according to occupation, is also briefly considered and the facts, presented in detail, are deserving of more attention than they have received in the past.

A very important contribution to the statistical study of cancer, with particular reference to occupation, social condition, etc., was published in 1904 in the "Journal of the German Society for Cancer Research." This investigation was made by a commission of the Medical Society of Stuttgart. The authors of the report were Drs. Weinberg and Gastpar. Investigations of this kind emphasize the extremely complex nature of the cancer problem statistically considered, and the conclusion that the intricacy of causal connection of the phenomena under observation increases in proportion to the number of separate circumstances or conditions subjected to critical analysis. Another important occupational study, with a due regard to organs and parts of the body affected, occurs in the Swedish cancer census of 1905-06, published in the "Journal of the German Society for Cancer Research" for 1909.

Karl Kolb, Secretary of the Cancer Society of Bavaria, contributed an instructive discussion of the relation of occupation to cancer, reduced to a uniform basis of a normal population with a due regard to age, to the "Journal of the German Society for Cancer Research" of 1910. This investigation includes some interesting data regarding the cancer incidence among nuns and nurses, but unfortunately the statistics were not reduced to rates on the basis of the living population. Many of the tables in this and other investigations would have been materially increased in value, if the data had been given by divisional periods of life, and in all cases by the organs or parts of the body affected.

Requirement for Scientific Statistical Research

The material brought together by these and other investigators has not received the required amount of qualified and strictly impartial consideration. It would seem useless to encourage statistical research of this kind unless there is more conformity to practical and standardized methods of inquiry. It would also seem much better to select a carefully chosen group of specific occupations apparently subject to an excessive incidence of cancer, or more or less relatively free therefrom, and to rigorously examine the details of the experience, with a due regard to the age distribution of the persons considered and the organs and parts of the body affected. If such an analysis were made of the cancer mortality of workers in agriculture, gardeners, florists, brewers, etc., known to be subject to a high cancer mortality, and tanners, miners, etc., known to be subject to a low or at least normal mortality, the results would be unquestionably of much value to the medical and surgical profession, as well as to those employed in the particular occupations considered. The present study must be considered inconclusive from this point of view, except in so far as it has been shown that there are unquestionably certain industries which make the persons employed therein distinctly liable to cancerous growths in varying forms, and that results of far-reaching value to the cancer problem as a whole may be derived from a more scientific study of the occupational incidence of cancer than has thus far been made.

CHAPTER V

CANCER AS A PROBLEM IN LIFE INSURANCE MEDICINE

Cancer in the Literature of Life Insurance Medicine—Early Life Insurance Experience Data—Discussion of Scottish Widows' Fund Experience—Observations Regarding Cancer Increase—Experience of American Life Insurance Companies—German and Austrian Insurance Experience—Medico-Actuarial Investigation—Family History—Effect of Build and Conjugal Condition—Cancer of Breast and Generative Organs among Single and Married Women—Experience of The Prudential Insurance Company of America—Cancer as a Life Insurance Problem.

Cancer in its relation to life insurance presents itself in a threefold aspect: first, as a problem in medical selection or insurance medicine, second, as an element in insurance experience, and third, as a question of state medicine, with a special regard to the educational value of cancer statistics and the feasibility of cancer control. The importance of the problem is set forth in the statement that the approximate mortality from cancer in the Continental United States for 1915 is over 80,000. Considered by organs and parts of the body affected, the estimated* mortality for 1915 is as follows:

Estimated Mortality from Cancer, by Organs and Parts, in Continental United States, 1915

Organ or Part	Deaths	Per Cent.
Buccal cavity	3,152	3.9
Stomach and liver	31,672	39.6
Peritoneum, intestines, rectum	10,616	13.3
Female generative organs	12,344	15.4
Breast	7,360	9.2
Skin	2,760	3.5
Other or not specified organs	12,096	15.1
	80,000	100.0

For the year 1910 the average age at death from cancer and other malignant tumors combined was 59.2 years for the registration area of the United States. For males the average age at death was 60.4 years and for females, 58.4 years. The average age at death in cancer of the buccal cavity was 63.1 years; in cancer of the stomach and liver, 61.2 years; in cancer of the peritoneum, intestines and rectum, 59.2 years; in cancer of the female generative organs, 53.8 years; in cancer of the breast, 58.3 years; in cancer of the skin, 68.0 years; and in cancer of other organs and parts of the body not specified, 56.9 years.

Cancer is essentially a disease of advanced adult life. Of the mortality from all causes in the registration area, 1908-12, at ages 45 and over, the proportion of deaths from cancer was 9.3 per cent., or 7.1 per cent. for males and 11.9 per cent. for females. During the period 1901-11 in the states included in the registration area in 1900 (Table 60, Appendix F, Part 1) the cancer death rate for all ages increased from 65.8

*Estimated on the basis of the actual distribution of the mortality by organs and parts in the United States registration area in 1913.

per 100,000 of population in 1901 to 83.9 in 1911. The cancer death rate of males increased from 48.7 to 64.2 per 100,000 of population, or 31.8 per cent., and the cancer death rate of females increased from 83.0 to 104.0, or 25.3 per cent. For males the increase in cancer during this period was 21 per cent. at ages 45-54; at ages 55-64 it was 39 per cent.; at ages 65-74 it was 40 per cent.; and at ages 75 and over it was 40 per cent. For females the increase in the cancer death rate at ages 45-54 was 11 per cent.; at ages 55-64 it was 27 per cent.; at ages 65-74 it was 32 per cent.; and at ages 75 and over it was 44 per cent.

Cancer and Insurance Medicine

As a problem in insurance medicine cancer presents unusual difficulties to both the examining physician and the medical director. The literature of the subject extends over more than half a century, since practically every authority on insurance medicine has given the subject at least incidental consideration. Most of the earlier writers, beginning with Brinton in 1856, emphasize the assumed hereditary character of cancerous affections, but as early as 1857 Ward called attention to the personal aspects of the disease, as made evident in "sallowness or pallor of the face, the general clayey hue of the skin, and peculiar sadness of expression." Also, "the anæmic, chlorotic aspect of females suffering from uterine derangement." Allen, who was one of the first American writers on insurance medicine, in his "Medical Examinations for Life Insurance," published in 1866, referred briefly to the subject, under the general title of tumors, giving a few directions of value in medical examinations and advising unconditional rejection even in the case of suspicion of a liability to non-malignant tumors, as involving danger by their anatomical position or as possibly requiring a severe surgical operation.

Observations by Sieveking and Moinet

Sieveking in 1874 advanced the view that while authorities differed as to the frequency with which cancer was hereditary, "all are agreed as to the general fact." He quotes Velpeau as being of the opinion that one in three cases of cancer showed a hereditary taint, Sir James Paget's investigations as yielding one in four, Sibley's statistics of the Middlesex Hospital as showing a proportion of one in twelve; but regardless of the wide variation he accepted the view of the "undoubted hereditariness of cancer."

Moinet in 1876 in his "Guide to Medical Examination for Life Insurance," also referred to the investigations of Paget as indicating a tendency of cancerous disease "to pass by inheritance from parent to offspring and to occur (probably by inheritance of common properties) in many members of the same family and generation."

Observations by Greene, Hall and Ramsey

These views have continued to prevail among writers on cancer as a problem in medical selection for insurance, and passing over a number of early authors whose conclusions are practically identical, a first reference requires to be made to the standard treatise by Charles Lyman Greene on "Medical Examination for Life Insurance," published in 1905, in which occurs the statement that "The hereditary nature of cancer is

a subject of dispute, but the weight of evidence is strongly in favor of a well-marked hereditary influence." Haviland Hall in 1906 in the third edition of his "Medical Examination for Life Assurance," writes that "Cancer comes next to consumption in regard to frequency of hereditary transmission." Ramsey in 1908 in his "Practical Life Insurance Examinations," accepts the hereditary theory of cancer occurrence, and Brockbank in 1908 in his work on "Life Insurance and General Practice," concludes that "Females show a greater tendency to inherit whatever is the condition which leads to cancer than males do, and they also die from it at a younger age than their brothers would."

London Equitable Experience, 1800-1821

Few of the writers on insurance medicine have given useful advice on methods of diagnosis to disclose either an existing cancerous condition or a well-pronounced tendency to the disease. The over-emphasis placed on the assumed hereditary theory has no doubt done much harm, in that it has prevented a due consideration of the non-hereditary aspects of the disease when considered from a life insurance point of view. It is also quite probable that most of the writers have taken for granted a general disposition on the part of the examining physician to accept and act upon the prevailing theories in medical diagnosis, direct and differential, which, it is needless to say, has made considerable progress during recent years. This conclusion applies not only to cancers in general, but particularly to cancer of the stomach and in the case of women, to cancer of the breast.

Cancer, in the experience of life insurance companies, has been the subject of occasional consideration, but not of very extended and thoroughly specialized inquiry. A review of the available statistics, extending over more than a century, tends to confirm the conclusion that during the long intervening period of time the mortality from cancer has gradually and persistently increased from a comparatively low rate of occurrence to a frequency that may appropriately be considered a menace to mankind. The earliest experience data are those of the London Equitable Society for the period 1800-21, in which out of 1,930 deaths from all causes, only 25, or 1.3 per cent., were from cancer; eliminating deaths under age 40, it appears that out of 1,720 deaths from all causes, 24, or 1.4 per cent., were ascribed to cancer.

Scottish Widows' Fund Experience, 1815-1852

The Scottish Widows' Fund published its experience for the period 1815-45, by divisional periods of life, but not by sex, including 642 deaths from all causes, and of this number only 6, or 0.9 per cent., were from cancer, but in addition thereto, 5, or 0.8 per cent., were ascribed to tumors. The experience of the same society for 1846-52 was published in the form of a treatise on medical statistics of life assurance, by James Begbie, in the year 1853. This experience includes 690 deaths from all causes, of which only 5, or 0.7 per cent., were from cancer, but 7, or 1.0 per cent. of the mortality, were ascribed to tumors. It is practically certain that in the experience of this company most, if not all, of the deaths from tumors were due to malignant growths, as made clear by the following remarks of the author:

Two of the cases of cancer occurred in the female breast; one in the testis of a young man of 26; and the remaining two in the face, the subjects being males of the ages of 56 and 63. Under the name of tumor, seven deaths are recorded. Two of these occurred in elderly gentlemen of 74 and 75; and the disease in both appeared to be of malignant growth. Two occurred in men of 41 and 57; the disease affected the abdomen, and was considered of encephaloid character. In another, the fatal disease appeared on the right side subsequent to amputation for disease of the knee-joint. The sixth death arose from malignant tumor of the foot; and the seventh from that of the jaw.

If, therefore, the deaths from cancer and tumors are combined, it appears that there were 12 deaths from malignant disease out of a total mortality of 690, or 1.7 per cent., which compares with a combined mortality from cancers and tumors of 11 deaths during the period 1815-45 out of a total mortality of 642, or also 1.7 per cent.

Scottish Amicable Experience, 1826-1860

The Scottish Amicable experience for 1826-60 was published in 1861, giving details of the mortality according to non-hazardous, hazardous and West Indian risk exposure, by ages and divisional periods of life. The non-hazardous risks were the most numerous, including 632 deaths of males, of which 11, or 1.7 per cent., were deaths from cancer, and 63 deaths of females, of which 3, or 5.3 per cent., were from malignant disease. In addition thereto, among the males there were 2 deaths from tumors, equivalent to 0.3 per cent. In the hazardous class of risks there were 47 deaths from all causes, with no deaths from cancer, and in the West Indian group of risks there were 31 deaths from all causes, also with no deaths from cancer.

Standard Life Company Experience, 1825-1855

The Standard Life Assurance Company experience for 1825-45 includes 193 deaths of males, of which none were ascribed to cancers or tumors, but out of 23 deaths of females, 1, or 4.3 per cent., was attributed to cancer. The experience of the same company for 1845-50 included 293 deaths of males and females and of this number 3, or 1.0 per cent., were ascribed to malignant disease. The same company also published its experience for 1850-55, including 424 deaths from all causes, of which 5, or 1.2 per cent., were attributed to malignant disease. In the report on the company's experience, published in 1858, the subject of cancer is referred to at some length, it being stated that the term includes cancer, scirrhus, fungus hæmatodes and some other malignant affections of less frequent occurrence. The report points out that

Diseases of this denomination have not hitherto received from Assurance Companies the attention which they appear to me to deserve. They are well known to be most frequent about middle life, and between that and commencing old age. They occur, therefore, chiefly at a period immediately subsequent to that at which many assurances are effected. Of 717 deaths during the last ten years among those assured in the Standard Assurance Company, no fewer than 426 happened among persons assured for the first time after the age of 40. Death from malignant disease is also frequent—more so than may appear either from the statistical returns of Assurance Companies, or from the mortality tables of the country at large. During the last quinquennium of the Standard Assurance Company, only five deaths are referred to malignant diseases, and three in the previous quinquennium—that is, a trifle above one per cent. of the total deaths in ten years. But the majority of deaths referred in the Table to disease of the stomach and disease of the uterus, 24 in number, have also undoubtedly arisen from malignant affections of these organs. Another addition may be confidently made of a fair proportion of 33 deaths

referred to disease of the liver. And I apprehend that a further addition must be made of a smaller, yet no insignificant, proportion of 46 deaths ascribed to disease in the bladder, disease in the kidneys, dropsy, and obstruction of the bowels; since it is no uncommon thing for structural changes of a malignant character to be at the foundation of these disorders. Assuming one-half of the first denomination, a fourth of the second, and a tenth of the third, to have been owing fundamentally to malignant degenerations of some internal organ, we will be under the truth, I apprehend, in thus raising the deaths from malignant diseases to *eight per cent.* of the mortality among persons assured after the age of forty.

It will not be easy to arrive at a more precise result than this from the experience of an Assurance Company. Greater accuracy may be effected by and by in the certificates of the cause of death, as medical men become better acquainted with their object, and the importance of accuracy in them. Accordingly, it is not unworthy of note, that the frequency with which malignant disease is mentioned in the certificates of death received by the Standard Assurance Company has increased since this paper was read to the Medico-Chirurgical Society two years ago. For of 192 deaths between 15th November, 1855, and 15th November, 1857, six are confidently referred to malignant diseases of the breast, leg, or stomach. But, in point of fact, there is an insuperable obstacle in the way of more definite information; one not to be removed by any amount of zeal or conscientiousness on the part of the certifying physicians. The proof of a disease being malignant in its nature can seldom be obtained, if it affect an internal organ, without an inspection of the body after death; and I regret to say that this is a rare help to Assurance statistics, at all events in the experience of the Standard Company. For the same reason it is vain to turn for better information to the mortality registers of the country at large. More precise information may perhaps be expected from the records of a great hospital, where, as in the Royal Infirmary of Edinburgh, pathological examinations are numerous, carefully made, and faithfully recorded. But various reasons may be stated against accepting results thus obtained as representing the incidents of an Assurance Company. Dr. William T. Gairdner has had the goodness to search for me the Pathological Registers of the Edinburgh Infirmary, which are kept with great accuracy, and the result is, that of 657 inspections there were only 28 [4.26%] in which malignant disease was found in one organ or another; and this number represents merely the relative frequency of malignant alterations of structure, not the frequency of death from that cause. There can be no question that the proportion thus arrived at is materially under what the experience of an Assurance Company would lead to, were it susceptible of an equally rigorous scrutiny.

Assuming in the meantime that malignant disease accounts more or less directly for the death of eight per cent. of the subjects of Assurance who die after assuring subsequently to their fortieth year, it is obviously very desirable to possess some means of avoiding such risks. The resources for that purpose, which are within reach at present, are in general not very precise, and perhaps are not often available. But they are the following:—1. The presence of cutaneous sores or excrescences of a dubious nature—indolent internal tumors, possibly not occasioning inconvenience for a time—suspicious enlargement of the external glands—special symptoms referrible to particular internal organs, such as a great liability to dyspepsia, as being a frequent precursor of scirrhus in the stomach—a progressive general emaciation, without apparent cause, and possibly even without loss of strength or other inconvenience for some months: 2. Proof of a tendency to malignant disease among the members of the immediate family of the proposer: and, 3. Proof of a tendency to scrofulous diseases either in the proposer himself, or among his nearest blood relations.

It is unnecessary to enlarge upon any of these criterions for the present. I may merely, in regard to the last of them, refer to what was said in my former quinquennial report on the apparent connection between the scrofulous and the cancerous constitutions, and add that further experience confirms me in the belief in the community of these constitutional infirmities. It is a common idea with medical men, when they grant health-certificates for the purpose of Assurance, to suppose that when a man who is a member of a decidedly scrofulous family reaches the age of 45 or 50 in a tolerably sound state of health, the family constitutional failing may cease to be regarded. This is a great error. On watching the history of such cases narrowly, it will often be seen that the constitutional infirmity betrays itself at last in an unusual liability to organic diseases of internal organs, in an inferior power of contending with diseases at large, or in the actual development of structural disease of the malignant type.

These observations would seem to sustain the conclusion that the recorded mortality from cancer during the early period of life insurance experience was probably short of representing with absolute completeness the total number of deaths from malignant disease, but it is equally clear that the tendency to include non-malignant diseases in the malignant group was quite pronounced.

Scottish Widows' Fund Experience, 1853-1859

The Scottish Widows' Fund Society's experience for 1853-59 includes 975 deaths from all causes, of which 28 were specifically ascribed to cancer, and 3 additional deaths to tumor. Cancer at this period was usually included in the class of diseases of uncertain seat, with reference to which it is observed by Dr. James Begbie, in a report printed in 1860, that

> In this class there is a slight increase,—the number of deaths from these causes being 59 on this occasion, and 40 at the former septennial period, that is, from 5¾ to 6 per cent. of the total mortality. This increase arises mainly from one source, namely, Cancer, under which there are 28 deaths against 5 in our former table. It is gratifying to find that, in consequence of the greater attention to accuracy in the returns, Debility has no place in our present investigation, and that Dropsy only figures as the cause of 4 deaths. The causes which have led to the large addition to the mortality from Cancer, no doubt originate in the same improvement in the certificates of death; but they can be traced also to the circumstance that the advanced age of the Society has brought forward an increasing number of risks to the age at which malignant disease more commonly develops itself. Of the 28 victims of Cancer who have fallen during the present investigation, ten effected assurance before 40 years of age; nine between 40 and 50; seven between 50 and 60; one between 60 and 70; and one after 70 years of age. Of these, only one died before 40; four between 40 and 50; five between 50 and 60; fifteen between 60 and 70; two between 70 and 80; and one—she who assured at 71—fell at the ripe age of 85. The average expectation of these parties was 25.14; their average endurance was 15.41 years. These emerged risks embrace nineteen males and nine females, and are distributed over sixteen professions or occupations, two of them only having a double number. In seven females the disease affected the breast; in one, its seat was in the liver; and in another, in the rectum. In one male it manifested itself in the breast; in three, in the abdomen; in three, in the gullet; in three, in the rectum; in two, in the tongue; in two, in the stomach; in two, in the groin; in one, in the kidney; and in one, in the lungs. In one only its seat has not been ascertained.
>
> There cannot be a doubt that, under the name of disease of the stomach and bowels, and of the liver, lungs, and other internal organs, many certificates of death have been returned, for which Cancer or other malignant disease could more appropriately have been substituted as the fatal cause.

The conclusions of Dr. Begbie are, therefore, quite in conformity to the experience of the Standard, previously referred to at considerable length, but the fact must not be overlooked that these observations and conclusions have reference to a large portion of the first half of the nineteenth century, when the medical diagnosis of the causes of death was naturally less perfectly developed than during more recent years of life insurance experience.

London Metropolitan Experience, 1835-1864

The London Metropolitan experience was published for the years 1835-64, by divisional periods of life, but not by sex. The number of deaths from all causes was 671, of which 16, or 2.4 per cent., were ascribed to cancers, and 2 additional deaths, or 0.3 per cent., to tumors.

British Empire Mutual Experience, 1847-1878

The early British Empire Mutual experience is for two periods, 1847-72 and 1873-78. During the first period there were 1,999 deaths from all causes, of which 43, or 2.2 per cent., were ascribed to cancer, and 14 additional deaths, or 0.7 per cent., were from tumors. In the period 1873-78 there were 1,179 deaths from all causes, of which 36, or 3.1 per cent., were attributed to cancer, and 6 deaths, or 0.5 per cent., to tumors. Subsequently the company published its experience for 1879-84, but without distinction of age and sex, including a total of 1,300 deaths from all causes, of which 42, or 3.2 per cent., were from cancer, and 10 deaths, or 0.8 per cent., were from tumors. The same company published its experience with reference to publicans only for the period 1846-76, including 123 deaths from all causes, of which 2, or 1.6 per cent., were deaths from cancer, and one additional death was from tumor.

The Gotha Experience, 1829-1878

The Gotha Life Insurance Company in 1902 published the results of its experience, by causes of death, during the period 1829-78. Out of 19,980 deaths from all causes, 1,322, or 6.6 per cent., were from malignant disease. In proportion to the exposed to risk, the mortality *rate* was 1.37 per 1,000, which compares with 1.36 for typhoid fever and 3.26 for tuberculosis of the lungs. Omitting ages 50 and under, the cancer death rate was 1.31 at ages 51-55, 2.26 at ages 56-60, 3.91 at ages 61-65, 4.92 at ages 66-70, 5.74 at ages 71-75, 4.95 at ages 76-80 and 5.56 at ages 81-85. The mortality from cancer is not discussed at length, but it is pointed out that the specific nature of the disease was not always indicated, so that no analysis could be made by organs and parts of the body affected.

Considered by duration of insurance, but limiting the exposed to risk to ages 36-75, inclusive, it is shown that the actual cancer mortality to the expected during the first year of insurance was 30.0 per cent.; during the 2d-5th years, inclusive, it was 76.4 per cent., and during the 6th-10th years, inclusive, it was 91.7 per cent. It would, therefore, appear that the mortality from cancer was reduced by medical selection during the early years of insurance duration, and as far as it is possible to judge, rather more so than in the aggregate mortality experience of the company for durations of less than six years.

King and Newsholme's Medico-Actuarial Observations

An investigation of unusual interest, with some reference to insurance experience, was made in 1893, by Mr. George King, a Fellow of the Institute of Actuaries, and Dr. Arthur Newsholme, the well-known author of a treatise on vital statistics. The investigation was published under the title "On the Alleged Increase of Cancer," appearing in the Proceedings of the Royal Society for 1893. For additional observations on the investigations of King and Newsholme see Chapter III. The investigation includes a study of the experience of the British Empire Mutual, previously referred to, and of the Scottish Widows' Fund, for the period 1860-87. The conclusions of these two distinguished authorities are summarized in the statement that "The increase in cancer is only apparent and not real and is due to improvement in diagnosis and more

careful certification of the causes of death. This is shown by the fact that the whole of the increase has taken place in inaccessible cancer, difficult of diagnosis, while accessible cancer, easily diagnosed, has remained practically stationary." With the highest regard for the weight of opinion expressed by Messrs. King and Newsholme, I feel constrained to hold that this conclusion is not fully and clearly sustained by the evidence submitted by them, nor by subsequent experience as derived either from life insurance data or from general sources of information. The authors of this frequently quoted report did not thoroughly examine the individual facts as regards diagnosis and death certification, which would, in any event, have been advisable, if not absolutely necessary, to substantiate their point of view. Their suggestion that trustworthy statistics of cancer should in *all* cases be based upon an autopsy and a microscopical examination of the diseased parts invalidates all cancer statistics, including the very data upon which they rely to sustain their conclusion that the increase in the cancer death rate is only apparent and not real. Since this conclusion has quite recently been advanced again and brought to public attention in this country, it has seemed of importance to refer to the controversy at some length elsewhere in this work. The argument was thoroughly considered by Dr. J. F. Payne in his Hunterian Society lecture, delivered on October 12, 1898, whose conclusions sustain the point of view that there has been an actual increase in cancer during recent years, measured with approximate accuracy by the available statistical data on the subject.

Scottish Widows' Fund Experience, 1874-1894

Not only is the theory of an actual increase in the mortality from cancer sustained by the mortality statistics of the general population, but corresponding evidence is to be derived from the experience of the Scottish Widows' Fund Society, upon which much reliance was placed by Messrs. King and Newsholme in the paper referred to. The results of an exhaustive investigation of the Society's experience during 1874-94, by its medical officer, Dr. Claud Muirhead, were published in 1902, in which, after calling attention to the increase in the cancer death rate of England and Wales, by divisional periods of life, during the years 1861-90, the author draws attention to the following facts:

(1) It is important to note that here, as elsewhere throughout this Report, deaths of Males only are considered.

(2) The term "Cancer" is employed as synonymous with "Malignant Disease," and includes all the various forms of cancer.

(3) In many cases, although Cancer was suspected, the certificates of death were very indefinite, and rendered it difficult to assign the disease to its legitimate class. Some of these unsatisfactory certificates were returned to the grantors of them, with a request for further details, which request was usually courteously responded to. In other cases, where the date of the certificate was so remote that it was unlikely that further information could be obtained, the details available have been most carefully considered; and where the age of the individual at death, the site of the lesion, and the duration of the final illness, have seemed to offer reasonable ground for believing it to be one of malignant disease, it has been so treated, and transferred to this sub-heading.

The total number of deaths from Cancer among the male lives assured in the Scottish Widows' Fund during the twenty-one years 1874-94, was 539, equivalent to 5.883 per cent. of the total mortality. The average age at death was 60.385 years. The following is a comparative statement of the total deaths in each of the three Septennia:—

Scottish Widows' Fund Experience, 1874-1894

Septennium	Number of Deaths	Percentage of Deaths in Septennium	Average Age at Death
1874–1880	122	4.935	61.980
1881–1887	165	5.440	59.819
1888–1894	252	6.889	59.985

Two points of interest are at once apparent from this Table—

(1) That, as measured by the total deaths from all causes, there has been a very considerable increase in the mortality from Cancer among our members during the 21 years. It is worthy of note that the actual number of deaths during 1888-94 was more than double the number during 1874-80.

(2) That there was a very serious decrease in the average age at death from 1874-80 to 1881-87, and a very slight recovery in age from 1881-87 to 1888-94. This is contrary to our experience for deaths from all causes, the average age at death for the total mortality in each Septennium being 57.083, 58.105, and 59.192 years respectively.

Before considering the apparent increase of Cancer among our members, let us look at our rate of mortality from that disease as compared with that for England:—

Annual Mortality from Cancer in England and the Scottish Widows' Fund among 10,000 (Males) Living at Each Group of Ages

Groups of Ages	England 1881-90	Scottish Widows' 1874-94
Between Ages 20 and 25	.57	..
" 25 and 35	.79	.82
" 35 and 45	2.97	2.56
" 45 and 55	9.98	7.48
" 55 and 65	22.99	23.99
" 65 and 75	37.42	41.91
Ages 75 and over	39.14	43.09

From this table we see that for the 21 years, 1874-94, from Group 55-65 onwards, our death rate was very considerably higher than that for England for 1881-90. This is a fact to which I shall refer later on.

I shall now proceed to consider the question of the apparent increase of Cancer, as a cause of death, among our members as compared with the increase among the community. For the purposes of this comparison I have taken the official figures for the two decennial periods 1871-80 and 1881-90 from the Supplementary Report referred to, because they are readily accessible and near enough in point of time to our own periods to afford comparative data:—

Comparative Mortality from Cancer in England and the Scottish Widows' Fund among 10,000 (Males) Living at All Ages

England			Scottish Widows' Fund Life Assurance Society					
Period	Death Rate	Ratio	Period	Death Rate	Ratio	Period	Death Rate	Ratio
1871–80	3.12	100	1874–80	7.86	100	1874–80	7.86	100
1881–90	4.30	138	1881–87	8.19	104	1888–94	10.42	133
Difference	1.18	38	Difference	.33	4	Difference	2.56	33

Inspection of this table brings out the following facts:—

(1) That the death rate from Cancer among the General Population (Males) of England increased 38 per cent. in 1881-90 as compared with 1871-80.

(2) That the death rate among the Members of the Scottish Widows' Fund—

(*a*) Increased 4 per cent. from 1874-80 to 1881-87.

(*b*) Increased 33 per cent. from 1874-80 to 1880-94.

That the rate of mortality among our members should only have increased 4 per cent. from 1874-80 to 1881-87 is surprising, and, combined with the fact that our rate of mortality at the older ages is considerably higher than that for the general population, appears to

support the theory that the increase in Cancer is only apparent. In the Supplement to the 45th Annual Report of the Registrar-General for England, issued in 1885, Dr. Ogle, commenting on the steady and progressive rise in the mortality from Cancer, remarked: "There can be very little doubt that a considerable part in this apparent increase is simply due to improved diagnosis, and more careful statement of cause on the part of medical men. . . The increase of mortality from Cancer has been much greater among males than among females. . . Now, were the rise not merely apparent but real, being due to general physical deterioration of the people or other similar causes, there would seem no reason why the male sex should have suffered more than the female; whereas the difference is readily intelligible on the hypothesis that the rise has been, at any rate in great measure, only apparent and due to better diagnosis. For the cancerous affections of males are in much larger proportion internal, or inaccessible, than are those of females, and consequently are more difficult of recognition, so that any improvement in diagnosis would add more to the male than to the female reckoning." This argument is repeated by Dr. Tatham in the Supplement to the 55th Report.*

If this argument be sound, it is evident that such a large increase would not be expected among the constituents of a Society like ours—the majority of whom can command the services of skilled medical men—as among the general community, and, as stated above, the small increase in our death rate from the first to the second Septennium seems to support this theory; but the figures relative to 1888-94 greatly diminish the force and cogency of the reasoning. Let me repeat that every death where there was a suspicion of Cancer has been carefully investigated, and if necessary included under Cancer, and under these circumstances I think it is evident that the theory that the large increase between the rate of mortality for 1881-87 and that for 1888-94—27 per cent.—was wholly, or even largely, caused by a sudden increase of diagnostic skill among the class of medical men who usually certify causes of death to the Society, is untenable. I am more inclined to believe that, in addition to the increase due to more exact returns, there has been a very real progressive increase in Cancer as a cause of death, and that the small increase in our death rate for 1881-87, and the large increase for 1888-94, are accounted for by the probability that an increase in a disease like Cancer would show itself, first among the general population, and last among selected lives.†

There is another aspect of the case to be considered, and one where our statistics directly controvert the reasoning of those who think that the increase in cancer is only apparent.

It has been sought to support this proposition by the statement that it is Cancer of the *internal* organs which is largely on the increase. These cases being obviously more difficult to recognize than corresponding affections of the *external* organs, the increase is ascribed to improved skill in diagnosis on the part of the Reporters.

Before proceeding to examine our statistics as to the truth or fallacy of this statement, it will be convenient to explain which lesions are regarded as External, and which as Internal. The arrangement is somewhat arbitrary, but is based upon the accessibility or non-accessibility of the parts to touch and sight. Hence the accessible lesions are styled External, the deeper and non-accessible lesions, Internal. As an Example of the External, Cancer of the Tongue may be cited, and of the Internal, Cancer of the Stomach.

We have in all 539 cases of Cancer to deal with, but for our present purpose 27 of these must be deducted, as in them the site of the disease was not specified, thus leaving 512 cases in which the site of the lesion was detailed. The following Table shows these 512 deaths subdivided into Cancer of the Internal and Cancer of the External Organs for the three Septennia, separately and combined; and the percentages which these numbers bear to the total in each period of time. The differences between the Ratios show the variations per cent. of these percentages, and indicate the increase or decrease per cent. from the first Septennium.

*For an extended discussion of the precise classification of cancer deaths as to whether of the accessible, inaccessible or intermediate organs or parts, see Chapter I and Table 8, Appendix A.

†I have quite fully discussed the question of accuracy and completeness in American death registration in an address at the Jacksonville meeting of the American Public Health Association (1914). The results of an original investigation of autopsy records compared with the clinical diagnoses will in course of time be published by the Johns Hopkins Hospital, of Baltimore, Md., including about 5,000 cases, thoroughly and critically considered by members of the medical department of The Prudential Insurance Company of America. This investigation is practically certain to add materially to the existing state of knowledge regarding the accuracy and completeness of death certification in a typical and representative city of America. The investigation is made jointly under the direction of Dr. M. C. Winternitz, resident pathologist of the Johns Hopkins Hospital, Dr. Walter A. Jaquith, Medical Director of The Prudential and myself.

Scottish Widows' Fund Experience, 1874-1894
Mortality from Cancer of the Internal and External Organs

Period	Deaths from Cancer of the Internal Organs			Deaths from Cancer of the External Organs			Total Deaths from Cancer Where Site of Disease Was Specified
	Number	Percentage	Ratio	Number	Percentage	Ratio	
1874–80	81	71.05	100.00	33	28.95	100.00	114
1881–87	107	70.86	99.73	44	29.14	100.66	151
1888–94	162	65.58	92.30	85	34.42	118.89	247
1874–94	350	68.36	..	162	31.64	..	512

From this it appears that the deaths from Cancer of the *Internal* Organs amounted to 71.05 per cent. of the total specified cases in the first Septennium, and to 65.58 per cent. in the third Septennium, equal to a *decrease* of 7.70 per cent. of the percentage value of the first; while the deaths falling into the *External* class formed in the first Septennium 28.95 per cent. of the specified cases, and 34.42 per cent. in the third Septennium, equal to an *increase* of 18.89 per cent. over the percentage value of the first.

The next Table shows that the increase in the death rate fully supports the results obtained by comparing the percentages of actual deaths.

Scottish Widows' Fund Experience, 1874-1894
Mortality from Cancer of Internal and External Organs, Separately and Combined, among 10,000 (Males) Living at All Ages

Period	Internal Organs		External Organs		Total	
	Death Rate	Ratio	Death Rate	Ratio	Death Rate	Ratio
1874–80	5.22	100.00	2.12	100.00	7.34	100.00
1881–87	5.31	101.72	2.18	102.83	7.49	102.04
1888–94	6.70	128.35	3.52	166.04	10.22	139.24

The statement made by Dr. Ogle and repeated by Dr. Tatham, that the chief increase in the mortality from Cancer among the community was due to the multiplication of male deaths, may be accepted without question; but our statistics do not support their contention that the additional deaths belonged to the Internal or Inaccessible Group, and in our Society our Reporters can not lay claim to any enlarged knowledge or greater skill by reason of an additional number of cases of Internal Cancer being diagnosed.

Going into detail, the two following Tables show the deaths from Cancer among our members during the three Septennia, separately and combined, subdivided among the organs affected; and the percentages these numbers bear to the total deaths from Cancer where the site of the disease was specified, in each period of time.

Scottish Widows' Fund Experience, 1874-1894
Mortality from Cancer of the Internal Organs

Organ Affected	1874-80 No.	1874-80 Per Cent.	1881-87 No.	1881-87 Per Cent.	1888-94 No.	1888-94 Per Cent.	1874-94 No.	1874-94 Per Cent.
Stomach	28	24.56	33	21.85	50	20.24	111	21.68
Liver	23	20.18	28	18.55	42	17.00	93	18.17
Bowel	5	4.39	15	9.93	23	9.31	43	8.40
Abdomen	7	6.14	13	8.60	14	5.67	34	6.64
Bladder	5	4.39	3	1.99	8	3.24	16	3.13
Mediastinum and thorax	1	0.88	8	5.30	4	1.62	13	2.54
Œsophagus	2	1.75	2	1.33	8	3.24	12	2.34
Prostate	3	2.65	2	1.33	3	1.21	8	1.56
Kidneys	2	1.75	1	0.66	4	1.62	7	1.37
Pancreas	3	2.63	..	..	3	1.21	6	1.17
Lung	2	1.75	1	0.66	2	0.81	5	0.98
Brain	..	..	..	..	1	0.41	1	0.19
Spinal cord	..	..	1	0.66	..	..	1	0.19
Total	81	71.05	107	70.86	162	65.58	350	68.36

Scottish Widows' Fund Experience, 1874-1894
Mortality from Cancer of the External Organs

Organ Affected	1874-80 No.	1874-80 Per Cent.	1881-87 No.	1881-87 Per Cent.	1888-94 No.	1888-94 Per Cent.	1874-94 No.	1874-94 Per Cent.
Rectum	12	10.52	26	17.22	30	12.14	68	13.28
Tongue	8	7.02	2	1.33	13	5.26	23	4.49
Tissues	4	3.51	5	3.31	8	3.24	17	3.32
Throat	3	2.63	1	0.66	5	2.02	9	1.76
Larynx	1	0.88	1	0.66	6	2.43	8	1.56
Bones	..	..	1	0.66	6	2.43	7	1.37
Mouth	1	0.88	2	1.33	2	0.81	5	0.98
Partoid	3	2.63	1	0.66	1	0.41	5	0.98
Glands	..	..	1	0.66	4	1.62	5	0.98
Penis	1	0.88	2	1.33	1	0.41	4	0.78
Jaw	..	..	..	..	4	1.62	4	0.78
Testes	..	..	..	..	2	0.81	2	0.39
Eye	..	..	1	0.66	1	0.41	2	0.39
Lip	..	..	..	..	2	0.81	2	0.39
Skin	..	..	1	0.66	..	..	1	0.19
Total	33	28.95	44	29.14	85	34.42	162	31.64

Let us now consider the question of the age at death of those of our members who died of Cancer.

We have already seen that the average age at death was considerably younger in 1881-87 and 1888-94 than in 1874-80. The following shows, by means of percentages, at what groups of ages the changes occurred:—

Scottish Widows' Fund Experience, 1874-1894
The Percentages at Groups of Ages of the Total Number of Deaths from Cancer in Each Septennium

Septennium	Under 25	Between Ages 25 and 35	Between Ages 35 and 45	Between Ages 45 and 55	Between Ages 55 and 65	Between Ages 65 and 75	Ages 75 and Over
1874–80	..	1.64	8.20	12.30	33.60	36.88	7.38
1881–87	..	1.21	9.09	19.39	37.58	23.64	9.09
1888–94	..	2.78	8.73	21.83	31.75	25.79	9.12
Variations in incidence of Mortality for 1874-80 and for 1888-94	..	+1.14	+0.53	+9.53	−1.85	−11.09	+1.74

The next table is a truer test of the incidence of the Cancer Mortality, for it takes into account not only the actual deaths, but also the number of living who were exposed to the risk of death for one year, and it practically reproduces in another form all the really important features of the preceding table.

Scottish Widows' Fund Experience, 1874-1894
Annual Mortality from Cancer among 10,000 (Males) Living at Each Group of Ages and at All Ages

Period	Ages under 25	Between Ages 25 and 35	Between Ages 35 and 45	Between Ages 45 and 55	Between Ages 55 and 65	Between Ages 65 and 75	Ages 75 and over	All Ages
1874–80	..	0.51	2.19	4.72	20.78	46.98	34.68	7.86
1881–87	..	0.42	2.37	7.34	25.89	33.67	42.22	8.19
1888–94	..	1.49	2.95	9.02	24.53	45.18	48.33	10.42

These tables unmistakably show that the age at which Cancer must be looked upon as a serious cause of death among our members is becoming younger. This fact is more strongly brought out by grouping together a larger number of ages at death. From the table showing the percentages at groups of ages we see that practically 90 per cent. of all our deaths from Cancer took place between ages 35 and 75. If, therefore, we group the

aths between these ages, the results will be probably more satisfactory than if we include the extremities of the table, because we shall then have eliminated what we may call ccidental" cases of death among our very old or very young members. A few cases of ath at either end included in a table like the following might have the effect of putg our view of the essential facts entirely out of focus.

Scottish Widows' Fund Experience
Proportionate and Relative Mortality from Cancer, 1874-1894

	PERCENTAGE OF DEATHS IN GROUPS OF AGES TO TOTAL CANCER DEATHS IN EACH SEPTENNIUM				ANNUAL MORTALITY AMONG 10,000 (MALES) LIVING AT EACH GROUP OF AGES			
	Between Ages 35 and 55		Between Ages 55 and 75		Between Ages 35 and 55		Between Ages 55 and 75	
Period	Per Cent.	Ratio	Per Cent.	Ratio	Death Rate	Ratio	Death Rate	Ratio
1874–80	20.50	100	70.48	100	3.23	100	29.35	100
1881–87	28.48	139	61.22	87	4.40	136	28.43	97
1888–94	30.56	149	57.54	82	5.63	176	30.85	105

Consideration of the first half of this table shows us that the actual number of deaths om Cancer during 1874-94 was steadily and rapidly transferred from Group 55-75 to oup 35-55, while the figures in the second half of the table show that the increase in our te of mortality was almost entirely confined to members under 55 years of age, the crease in the death rate among the members between 55 and 75 years of age, from 1874-80 1888-94, being only 5 per cent., while for the other group it was 76 per cent.

Medical Observations and Conclusions Regarding Cancer Increase

Reviewing the data which have been submitted, the following conclusions seem to be stified—

1. The registered increase in the number of deaths from Cancer is undoubted. This is oved by our own statistics, and corroborated by all other authorities.

2. After "allowing that this increase is not wholly real, but may be accounted for, to me extent, on the assumption that the true nature of obscure cases of malignant disease s been recognized with ever-increasing certainty in recent years, and that, as a conquence, the statement of death has been made with greater precision than had been rmerly the case," there remains a large real increase to account for the large and proessive mortality from this disease.

3. The Age Period at which death from Cancer is most frequent is gradually declining cording to the Scottish Widows' Fund Returns.

4. The average age at death from Cancer among our members declined by two years om 1874-80 to 1888-94, as contrasted with a rise in the average age at death from all uses of a little over two years.

5. The Office returns mark a *decrease* in deaths from *Internal* Cancer of 7.70 per cent., d an *increase* in deaths from *External* Cancer of 18.89 per cent. of the percentages in the rst Septennium as contrasted with the Third.

Highly interesting as are these statistics, they partake more of scientific than of actical value. They do not enlighten us as to how we may diminish our mortality from is ever-increasing cause of death. We learn from them, however, that during the twentye years under observation, Cancer as a cause of death among our members aged from 45 65 has made rapid and startling progress. If we compare 1874-80 with 1888-94, we find at practically one-third of all our deaths by Cancer occurred between ages 55 and 65 each Septennium, but that a great change took place in Groups 45-55 and 65-75, the ures for the first group increasing from 12 per cent. to 22 per cent., and in the last deasing from 37 per cent. to 26 per cent. Again, the rate of mortality was nearly doubled Group 45-55, and increased by 18 per cent. for Group 55-65, while remaining practically nstant for Group 65-75. These facts may help us when a proposal is made to the ciety, in which the proposer states that one, or even two, of his predecessors died from ncer. For although our Records show that only about 8 per cent. of our Members who d of Cancer during the twenty-one years under observation stated in their Proal Sheets that some near relative had died of Malignant Disease, the high age at which ncer ends fatally would prevent their family history being anything like complete at the e they proposed for assurance; and the general consensus of opinion goes to show that edity has a certain importance in Cancer, and cannot be wholly disregarded, although annot be denied that less weight is attached to it now than in former days. If, then,

a proposer whose family history is tainted as indicated, desires a Policy on the Endowment Assurance Scale, maturing at age 45 or 50, I consider that this family history of Cancer may be entirely ignored. But if the policy asked for be an Endowment Assurance maturing at an older age, or a Whole Life Assurance, it is a question whether such a proposal should be accepted at ordinary rates. The mortality from Cancer rapidly appreciates after age 50, and, after careful consideration, I am of opinion that probably the best way of treating such a proposal would be to accept it on the Endowment Assurance Scale at age 55 or death.

The experience for each Septennium is briefly presented in the following summary observations:

1874-80.—To this terrible disease 122 members fell victims—a number equivalent to 4.935 per cent. of the septennial mortality. The average age at death was 61.980. Twelve of these members stated in their Proposal Sheets that either father or mother had died of Cancerous affections.

1881-87.—During this Septennium 165 members died from Cancer, equivalent to 5.440 per cent. of the septennial mortality. The average age at death was 59.819. Ten stated that either father or mother had died of Cancer.

1888-94.—The number of deaths due to this cause was 252, equivalent to 6.889 per cent. of the septennial mortality. The average age at death was practically the same as in the previous Septennium, viz., 59.985 years. Twenty of the deceased admitted a family history of Cancer at date of Assurance.

On account of their exceptional value, these observations by a thoroughly qualified medical officer of one of the foremost life insurance institutions in the world have been given in full, since the original publication is, as a rule, not conveniently available. They require to be taken into account by all who rely primarily for their conclusions regarding the increase in cancer upon more or less inadequate statistical data and who blindly accept the findings of Messrs. King and Newsholme, of a date since which the general cancer death rate has continued to increase, not only in England and Wales, but in practically every civilized country of the world.

London Prudential Experience, 1867-1870

Some interesting experience data were published in London in 1871 under the title "Mortality Experience of the Prudential Assurance Company, in the Industrial Branch, for the Years 1867-70, with Observations by Henry Harben." This experience included 17,399 deaths of males from all causes and 17,773 deaths of females. The number of male deaths from cancer was 138, or 0.79 per cent., and of female deaths, 352, or 1.98 per cent. The experience includes almost exclusively lives of the working class, which at that period was in a much less satisfactory economic condition than at the present time. Since the mortality from cancer is apparently more common among the well-to-do than among the poor or wage-earning element, these early statistics of the London Prudential are of some practical value in connection with the present inquiry.*

Mutual Life Insurance Company Experience, 1843-1873

The Mutual Life Insurance Company of New York, in 1877, published the results of its mortuary experience for the period 1843-73. The

*For observations on the comparative cancer mortality of the rich and the poor, see "Natural History of Cancer," by W. R. Williams. There are numerous references to the subject in this work, under the index title "Wealth in relation to cancer proclivity." The collective evidence seems to favor the view that the well-to-do are more liable to cancer than the poor. The same subject is discussed in the third volume of the treatise by J. Wolff, who refers to the earlier investigations by Tanchou and Walshe and the more recent inquiries by Braithwaite, who maintains that there is a distinct correlation between excessive meat consumption and cancer frequency; but the data upon which these conclusions are based must be considered inadequate to the purpose.

r of deaths of males from all causes was 5,223, of which 94, or er cent., were deaths from cancer. There were 8 deaths from among the 162 females who died during the period referred to, 4 per cent. Considering that the class of risks dealt with was entative of the more prosperous or well-to-do element of the ation, subject to more trustworthy methods of medical diagnosis eath certification than the population at large, it is significant he number of deaths from cancer should have been less than 2 per for insured males. In view of the unusually low mortality, the al observations by the authors of the report referred to are of some st and therefore given, in part, as follows:

had previously shown that the mortality from Cancer compared with that from all was small for the first five years of insurance, and became very much greater after eriod. Cancer is usually chronic in its course, often taking years before the final esult. Hence the medical examination eliminating those already affected with the , it will be only after a few years have elapsed that there can be many deaths from r. We find, however, one marked exception to this rule: the mortality in the first fter insurance is remarkably high, being double that of the second year. This may rely a matter of chance, on account of the small number of figures; but it is most ble that the disease existed at the time of insurance, and that the applicants denied cealed their symptoms from the scrutiny of the medical examiners.

e relatively high mortality from cancer during the first year of ance is not confirmed by subsequent insurance experience, but it be taken into consideration that the actual experience of the any was relatively small. Aside from the foregoing observations pointed out in the report that the proportionate mortality from r was higher among foreigners than among natives and that there een only three cases in which there was a family history of the se. The concluding observations on cancer in relation to medical ion are in part:

hough, as we have seen, the difference in the mortality from Cancer among the l and general population is very great, still it is not a disease which we would expect much influenced by medical selection. The etiology of Cancer is too obscure to us to detect the probabilities of its approach. Age, inheritance, occupation, and s climate and nationality, have some influence on its causation; but, in the words of nes Paget, "After all, when we have assigned to these conditions their full weight in ing the cancerous constitution or state of the blood, that which may strike us most s the comparatively small influence which any known internal or external conditions s."

Washington Life Insurance Company Experience

e Washington Life Insurance Company published a volume of rial and medical statistics in 1889, including an analysis of 2,000 cutive deaths, of which 68, or 3.4 per cent., had been deaths from r. There were also 7 additional deaths from tumors, equivalent to per cent. of the mortality from all causes. The report includes interesting observations on the relation of family history to the se and the value of medical selection, but the number of deaths dered is unfortunately too small to warrant the acceptance of these usions as entirely trustworthy at the present time. It may be d, however, from the report, that

hough cancer is usually classed among hereditary diseases, there is a wide difference ion among authorities as to the exact part played by the hereditary taint in the on of the disease. Velpeau believed that one in three cases of cancer showed an

inherited predisposition; Sir James Paget's investigation yielded one in four; Mr. Sibley concluded from the statistics of the Middlesex Hospital that the proportion was less than one in twelve; the late Willard Parker found a record of cancer in the family of only 56 out of 397 cases of cancer of the breast operated on by him. He expressed it as his well considered opinion that cancer is not a hereditary disease.

In the experience of the Washington Life Insurance Company, out of 2,000 deaths from all causes, 56 were deaths of persons with cancer in the family history; but out of 68 deaths from cancer in the company's experience, only one death was of a person with a history of cancer in the family. It was therefore shown by this experience that the data "support the opinion that has been gaining ground of late among medical men, namely, that the hereditary element is not such an important factor in the production of cancer as was formerly believed." It may be stated in this connection that the average age at entry of the 56 cases with a family history of cancer was 43 years, and the average age at death, 52.62 years, giving an average policy duration of 9.62 years, in comparison with an average policy duration for the 2,000 deaths from all causes of 8.54 years. This experience, therefore, limited as it was, seemed to warrant the conclusion that "Regarded from the standpoint of life insurance, a death from cancer in the family record of an applicant does not necessarily prejudice the risk in any respect."

Gresham Company Experience

An earlier experience is that of The Gresham Life Assurance Society, published in 1868, including 1,000 deaths from all causes, of which 21, or 2.1 per cent., were deaths from cancer. In addition, however, there were 4 deaths from tumors, equivalent to 0.4 per cent.

Clergy Mutual Experience, 1829-1887

A more conclusive experience is that of the Clergy Mutual Assurance Society for the period 1829-87, published in 1891, including 2,119 deaths from all causes, of which 102, or 4.8 per cent., were deaths from cancer. In addition, the society recorded 71 deaths in its experience with substandard lives, but of this number only 2, or 2.8 per cent., were deaths from cancer.

Mutual Life Experience, 1843-1898

The combined experience of The Mutual Life Insurance Company of New York for the period 1843-98, was published in 1900,* including 44,985 deaths of males, of which 1,882, or 4.18 per cent., were deaths from cancer. In the same experience there were 1,540 deaths of females, of which 127, or 8.25 per cent., were deaths from cancer. In addition thereto there were in the male experience 120 deaths from tumors, or 0.27 per cent. of the deaths from all causes; and in the female experience there were 8 deaths from tumors, equivalent to 0.52 per cent. The cancer mortality, by divisional periods of life, is given in full in the table following:

*Report Exhibiting the Experience of The Mutual Life Insurance Company of New York for fifteen years ending February 1, 1858, New York, November, 1858. Report on the Mortality Records of The Mutual Life Insurance Company of New York, 1843-1914, New York, 1900. (See Tables 32-33, Appendix D.)

CANCER AND LIFE INSURANCE

Cancer Mortality Experience of
The Mutual Life Insurance Company of New York, 1843-1898

	MALES			FEMALES		
Ages at Death	All Causes	Cancer	Per Cent.	All Causes	Cancer	Per Cent.
Under 20.......	38	..	..	2	..	..
20–24.......	569	3	0.53	30	..	..
25–29.......	1,775	10	0.56	78	..	..
30–34.......	2,900	34	1.17	136	1	0.73
35–39.......	4,034	81	2.01	141	6	4.26
40–44.......	4,307	128	2.97	175	18	10.29
45–49.......	4,621	180	3.90	156	19	12.18
50–54.......	4,944	253	5.12	159	25	15.72
55–59.......	5,283	331	6.27	185	21	11.35
60–64.......	5,016	305	6.08	160	17	10.63
65–69.......	4,593	273	5.94	122	8	6.56
70–74.......	3,406	170	4.99	71	9	12.68
75–79.......	2,212	89	4.02	92	1	1.08
80–84.......	956	23	2.41	25	2	8.00
85 and over.....	309	2	0.65	7	..	..
All ages......	44,985*	1,882	4.18	1,540†	127	8.25

*Including 22 age not stated. †Including 1 age not stated.

According to this experience the proportionate mortality was highest for males at ages 55-59, when it was 6.27; and for females at ages 50-54, when it was 15.72 per cent. The proportionate mortality from cancer during four periods of time is shown below.

Cancer Mortality Experience of
The Mutual Life Insurance Company of New York, 1843-1898

	ALL AGES			AGES UNDER 45			AGES 45 AND OVER		
	Deaths from All Causes	Cancer No.	Cancer Per Cent.	Deaths from All Causes	Cancer No.	Cancer Per Cent.	Deaths from All Causes	Cancer No.	Cancer Per Cent.
				MALES					
1843-73...	5,223*	94	1.80	2,674	25	0.93	2,527	69	2.72
1874-85...	10,839	449	4.14	3,028	71	2.34	7,811	378	4.84
1886-93...	14,568	631	4.33	3,658	65	1.78	10,910	566	5.19
1894-98...	14,355	708	4.93	4,263	95	2.23	10,092	613	6.07
1843-98...	44,985*	1,882	4.18	13,623	256	1.88	31,340	1,626	5.19
				FEMALES					
1843-73...	162†	8	4.94	76	5	6.58	85	3	3.53
1874-85...	247	24	9.72	74	4	5.41	173	20	11.56
1886-93...	456	45	9.87	147	10	6.80	309	35	11.33
1894-98...	675	50	7.41	265	6	2.26	410	44	10.73
1843-98...	1,540†	127	8.25	562	25	4.45	977	102	10.44

*Including 22 age not stated. †Including 1 age not stated.

Northwestern Mutual Experience, 1857-1909

Among more recent data are the statistics of the Northwestern Mutual Life Insurance Company for the periods 1857-85 and 1886-1909. The proportionate mortality from cancer during the first period was

3.4 per cent., against 5.8 per cent. during the last. Naturally, in the case of this as in the experience of some of the other companies referred to, the increasing average age of the insured and a possibly larger proportion of persons insured at ages 40 and over would tend, in part at least, to bring about an increased proportionate mortality from cancer, but there are reasons for believing that, if the required correction were made, that the more recent experience would exhibit an actual increase in the cancer death rate over earlier years.

German Germania Experience, 1857-1894

A large amount of additional statistical information on the subject of cancer is available for American and foreign insurance companies, but the data can be only very briefly referred to. The experience of the Germania, of Stettin, published in 1897, sustains the Gotha experience as regards the value of medical selection in reducing the mortality from cancer during the earlier years of insurance. Considering the two periods of duration of five years or less and six years or more, it appears that the actual mortality of males per 1,000 at ages 31-40 was 0.21 and 0.32, respectively; at ages 41-50 it was 0.67 and 1.14; at ages 51-60, it was 1.97 and 2.87; and at ages 61 and over, 4.63 and 6.64. The results for females are about the same. The cancer death rate for males was 1.33 per 1,000, and for females, 1.90. The experience covers the period 1857-94. It may be stated in this connection that for women only the death rate from cancer during the period 1857-82 was 1.38 per 1,000, whereas for the entire period, 1857-94, it was 1.90. There had, therefore, been a not inconsiderable increase in the cancer mortality during the later years, but to be entirely conclusive, the experience should have been extended to insurance durations and divisional periods of life.

Austro-Hungarian Experience

In the experience of the Austrian Phœnix, the proportionate mortality from cancer has increased from 8.5 per cent. during the five years ending with 1906 to 10.4 per cent. during the five years ending with 1912. In the experience of the Riunione Adriatica di Sicurta, of Trieste, the proportionate mortality from cancer has *decreased* from 9.3 per cent. during the seven years ending with 1905 to 8.0 per cent. during the seven years ending with 1912. In the experience of the Alte Leipziger,* which is one of the largest German life insurance companies, the percentage of deaths from cancer has increased from 11.8 during the ten years ending with 1902 to 12.6 during the ten years ending with 1912. In the experience of a large Hungarian company, the Fonciere, however, the proportionate mortality from cancer has declined from 8.6 per cent. during the five years ending with 1905 to 8.0 per cent. during the five years ending with 1911. In the experience of the Assicurazioni Generali, the largest Austrian company, the proportionate mortality from cancer was 9.2 per cent. during 1899-1905, against 9.5 per cent. during 1906-12. The experience of many other foreign companies could be quoted to sustain the conclusion that in most cases the proportionate mortality from cancer has increased during recent years and that, in any event, the

*Leipziger Lebensversicherungs-Gesellschaft, Leipzig, Germany.

mortality from malignant disease is of much greater importance to life insurance companies than has generally been assumed to be the case. In this connection it is necessary to take into account the probability that medical selection during the last twenty or thirty years has become more effective, on account of the use of more exact and conclusive methods of medical examination for insurance. Better selection would, of course, tend to reduce the mortality from diseases more accurately diagnosed, particularly during the early years of policy duration. It is true that the rejection rate for cancer is comparatively small, but the implication is that the more general regard to abnormal or subnormal bodily conditions would tend to eliminate applicants predisposed to malignant disease.

American Insurance Experience, 1869-1900

American investigations tend to confirm this point of view. In 1903 the combined experience of thirty-four American life insurance companies was published by the Actuarial Society of America. It was brought out with reference to persons who had a family history of cancer that the subsequent experience had been very good with young entrants, almost equally good with mature entrants, fairly good with elderly entrants, but not good with old entrants, although the actual number of the latter was hardly sufficient for a final adverse conclusion. On account of their importance the facts are given in detail in the table below, showing first, the actual number of deaths from cancer, second, the number of deaths expected by the standard table adopted and third, the ratio of actual deaths from cancer to every 100 expected.

Mortality Experience of Applicants with a Family History of Cancer Thirty-four American Companies, 1869-1900

Age at Entry	Actual Deaths	Expected Deaths	Ratio of Actual to Expected Deaths
15–28	251	333.7	75.2
29–42	1,089	1,313.6	82.9
43–56	1,138	1,186.3	95.9
57–70	352	320.6	109.8
15–70	2,830	3,154.2	89.7

It is regrettable that the causes of death were not given in this experience, so as to show what proportion of the mortality of persons with cancer in the family history was actually from cancer, or, if not, from what other causes.

Medico-Actuarial Investigation, Males*

The most recent collective investigation is for the period 1885-1908. The number of deaths of males at ages 15-29 was 4,566, of which 95 were from cancer and other malignant tumors, or 2.1 per cent. The cancer mortality rate at this period of life was 1.0 per 10,000 exposed to risk. At ages 30-44 the number of deaths from all causes was 7,886, of which 377, or 4.8 per cent., were from cancer, equivalent to a rate of 3.2 per 10,000 exposed to risk. At ages 45 and over there were 5,340

*Medico-Actuarial Mortality Investigation, New York, 1913, Vol. ii, p. 26, et seq.

deaths from all causes, of which 411 were from cancer, or 7.7 per cent., equivalent to 14.4 per 10,000 exposed to risk. The proportionate mortality and the death rate from cancer and other malignant tumors, of males, by divisional periods of life and duration of insurance, are given in the table following:

Experience of American Insurance Companies, 1885-1908
(Medico-Actuarial Investigation)
Mortality from Cancer and Other Malignant Tumors

STANDARD LIVES, MALES

Policy Years	Number of Policies Terminated by Death			Percentage of Total Deaths			Ratio per 100,000 Exposed to Risk		
	Ages at Entry 15-29	30-44	45-over	Ages at Entry 15-29	30-44	45-over	Ages at Entry 15-29	30-44	45-over
1.........	4	7	15	.6	1.0	3.5	.2	.4	3.2
2.........	4	25	42	.7	3.6	9.4	.3	1.9	12.0
3–5.......	18	72	111	1.4	3.9	8.9	.7	2.3	13.6
6–10......	30	105	129	2.5	4.7	7.8	1.2	3.3	16.4
11–24.....	39	168	114	4.1	7.0	7.3	2.3	7.6	26.3
Total......	95	377	411	2.1	4.8	7.7	1.0	3.2	14.4

This table confirms the experience of the Gotha and of the German Germania, as well as of other companies, as regards the value of medical selection during the early years of insurance, but the value of selection is distinctly less in the case of applicants ages 45 and over.

Medico-Actuarial Investigation, Females

The same experience has been made up regarding women policyholders. At ages 15-29 the number of deaths from all causes among insured women was 3,696, of which 98, or 2.7 per cent., were deaths from cancer, or 1.4 per 10,000 exposed to risk. At ages 30-44 there were 5,661 deaths from all causes, of which 668, or 11.8 per cent., were deaths from cancer, equivalent to a rate of 7.3 per 10,000 exposed to risk. At ages 45 and over there were 4,917 deaths from all causes, of which 654, or 13.3 per cent., were deaths from cancer, or 24.3 per 10,000 exposed to risk. The mortality from cancer among women, by divisional periods of life and duration of insurance, is shown in the table below:

Experience of American Insurance Companies, 1885-1908
(Medico-Actuarial Investigation)
Mortality from Cancer and Other Malignant Tumors

STANDARD LIVES, FEMALES

Policy Years	Number of Policies Terminated by Death			Percentage of Total Deaths			Ratio per 10,000 Exposed to Risk		
	Ages at Entry 15-29	30-44	45-over	Ages at Entry 15-29	30-44	45-over	Ages at Entry 15-29	30-44	45-over
1.........	7	50	55	1.1	6.4	13.6	.5	3.0	12.1
2.........	5	52	64	.9	6.9	15.8	.5	4.0	18.1
3–5.......	24	199	196	1.9	11.0	15.2	1.0	6.6	23.5
6–10......	26	240	212	3.0	15.6	13.1	1.6	10.3	28.8
11–24.....	36	127	127	11.5	16.3	10.5	7.2	15.4	40.7
Total......	98	668	654	2.7	11.8	13.3	1.4	7.3	24.3

This table also confirms the previously expressed conclusion as regards the value of medical selection in reducing the mortality from cancer during the early years of insurance, but, as in the case of males, more distinctly with regard to younger applicants, and only to a limited extent for applicants ages 45 and over. The American insurance experience with both men and women therefore emphasizes the considerable importance of cancer as a cause of death at ages 30 and over.

Family History of Cancer

The influence of a family record of cancer, including two or more cases, was investigated by the Medico-Actuarial Committee, but with negative results. The number of expected deaths in the group of applicants having a family record of two or more cases of cancer in the family history was 87.3, but the actual number of deaths experienced was only 69, or 79 per cent. of the expected. Of the 69 deaths only 4 were from cancer. The evidence is, therefore, quite conclusive that the earlier apprehensions regarding a family history of cancer were not justified by the facts of subsequent experience. In contrast, it may be stated that the ratio of actual to expected deaths in cases in which there was a family record of two or more cases of heart disease was 113 per cent.*

Effect of Build

The Medico-Actuarial Investigation considered also the relation of build at entry to causes of death, with distinction of three divisional periods of life. Dividing the male applicants into three classes; that is, first, overweights, or those whose weight at entry was 50 pounds or more above normal weight, second, those who were of normal weight, and third, underweights, or those who weighed 25 pounds or more below normal weight, the experience with reference to cancer was as follows: the cancer death rate per 10,000 exposed to risk at ages 15-29 was 0.9 for overweights and 0.8 for underweights, at ages 30-44 it was 3.7 for overweights and 2.4 for underweights, and at ages 45 and over 15.6 for overweights and 12.0 for underweights. The experience, therefore, supports the view occasionally expressed by writers on the subject of cancer occurrence that the disease is more common among persons of overweight than among underweights, and by inference, among the well-to-do and overnourished than among the less prosperous element. The medico-actuarial evidence is of exceptional value, in that it confirms this conclusion for three periods of life on the basis of what may safely be considered to have been a sufficient numerical exposure.†

Effect of Conjugal Condition

Considering the importance of this conclusion it is a matter of regret that a corresponding investigation into the mortality of overweights and underweights, by causes of death, should not have been made with

*Medico-Actuarial Mortality Investigation, New York, 1913, Vol. iv, Part i, p. 24.

†In the third volume of the treatise on cancer by J. Wolff (p. 37) there is a brief discussion of the probable correlation of height to cancer frequency, the view being advanced that cancer is more common among tall persons than among those of short stature. This phase of the cancer problem has not been sufficiently inquired into, which holds true also of the anthropometric aspects of the cancer problem in general. It, however, requires to be kept in mind that there is an important correlation of height to weight and that persons of short stature are as a rule more likely to be overweight than persons above the normal average height.

regard to women, but some exceedingly interesting data are furnished by the investigation of deaths according to conjugal condition, briefly set forth in the following table:

Experience of American Insurance Companies 1885-1908
(Medico-Actuarial Investigation)
Mortality from Cancer and Other Malignant Tumors, according to Conjugal Condition (Rate per 10,000 Exposed to Risk)

	Ages at Entry 15-29	30-44	45-over
Spinsters	0.9	5.2	15.4
Married (beneficiary, husband)	1.5	7.1	20.9
Married (beneficiary other than husband)	2.9	8.0	26.4
Widowed and divorced	1.7	10.3	25.9

According to this table the mortality from cancer and other malignant tumors was distinctly higher at all periods of life among married and widowed women than among spinsters. The married women, for insurance purposes, have been divided into two classes: the first being those who had made their husband the beneficiary in the event of their death and the second being those whose beneficiary was other than their husband. The latter class throughout show a distinctly higher mortality from cancer and other malignant disease. The evidence as regards a lesser liability of spinsters to cancer (all forms) would seem to be conclusive, since the comparative rates represent an apparently sufficient exposure for each of the three divisional periods of life.

These results of the medico-actuarial investigation are in conformity to a special analysis of the data for the District of Columbia, which, however, have not been completely standardized for variations in age distribution. For males the cancer death rate for the married was 108.8 per 100,000 of population, ages 15 and over, against 56.6 for the single, and for females the rates were 122.7 for the married and 59.9 for the single. With special reference to cancer of the generative organs, the rates were 41.4 for the married and 11.0 for the single, and for cancer of the breast the rates were 22.0 for the married and 17.8 for the single. When standardized for age these differences would, of course, be more pronounced. These rates refer to the white population only.

Cancer of the Breast and Generative Organs among Single and Married Women*

Some exceptionally valuable observations on the relative frequency of cancer of the breast and of the generative organs among the single and the married have recently been published in the 76th Annual Report of the Registrar-General of Births, Deaths and Marriages in England and Wales (London, 1915). This investigation is the first of its kind, but the conclusions are extremely important. Deaths from cancer of the ovaries, the uterus and the breast are separately considered, according to conjugal condition, with a due regard to the number of single and married women living at specific periods of life. The usual error arising out of an unequal age distribution is therefore avoided. As observed in

*On account of the preceding discussion with reference to insurance, this section is here included, although derived entirely from the 76th Annual Report of the Registrar-General for England and Wales, London, 1915.

the report, the effect of marital condition upon the mortality from cancer of the generative organs and the breast "is seen to be very considerable." During the three years 1911-13 (which were combined to secure a sufficient basis of facts for the purpose and to eliminate chance fluctuations), "the mortality of single women from cancer of the ovary has been twice as great as that of the married, due allowance being made for the different age-distributions of these two sections of the population. The mortality of the unmarried from cancer of the breast similarly exceeded that of the married by 45 per cent." But, in contrast, "from cancer of the uterus the married suffered from a mortality 73 per cent. greater than the single." The term married for the present purpose includes the widowed and divorced.

It is pointed out that these results are at variance with the usual conclusions deduced from the available material by surgical authorities, on account of the fact that proper correction is not made for the considerable variations in the age distribution of the single and married, and the equally important variations in the age incidence of the three forms of cancer considered, that is, of the ovary, the uterus and the breast. Extreme care was used in standardizing the rates for the married and single by divisional periods of life, but the methods employed are too technical to require consideration in a work of this kind. They are fully explained in the report, which is conveniently available for general use. The term cancer as employed for the present purpose includes sarcoma, but in the statistical tables the facts are given separately. The general results of this important investigation are briefly summarized as follows:

During the period of active sexual life there is practical equality of mortality from breast cancer among the single and the married, but after age 45 the excess among the single becomes very pronounced. The great excess of mortality from cancer of the uterus among the married is in accordance with the generally accepted views upon this subject. It is regrettable that it should not have been feasible to distinguish cancer of the body of the uterus from cancer of the cervix. In course of time it is to be hoped that all death certificates will be amplified and made to contain these as well as some other necessary additional facts. It is generally held that cancer of the body of the uterus is not more common in mothers than in other women, or more frequent in women who have not given birth. Cancer of the cervix is thought to result from past injury in labor, but few of the certificates give the necessary information, so that for the time being no conclusive answer can be made to this important question. It is shown by the report that "in the case of uterine cancer the difference in mortality between the married and the single is much greater before than after 50, and that the difference practically disappears after 75. In other words, the difference is most pronounced in the case of uterine cancer and least so in cancer of the breast, but "in each case it is the mortality of the single which increases relatively to that of the married with the advance of age."

The importance of treating sarcoma separately is emphasized in the case of cancer of the ovary, where sarcoma is relatively more frequent than in the uterus or breast. In this case, it is pointed out that "the excess of mortality amongst the single is very great at all ages after 35,

at which the number of deaths is sufficient to attach significance to the figures. The effect of marital condition upon [cancer] mortality would seem to be at its maximum in the case of the ovary, but has not perhaps attracted so much attention as in the case of the uterus or breast—presumably on account of the lesser frequency of the condition."

The rate of increase in mortality from cancer of the various organs considered is shown to differ quite considerably. After pointing out that "in both sexes the most rapid rates of increase are furnished by cancer of the alimentary tract, especially the intestine and stomach," it is observed that "disease of the female breast also claims a rapidly increasing number of victims, while mortality from uterine cancer is diminishing." This curious but very interesting result is in part attributed to the diminishing birth rate, and it is said in this connection that "It would appear that child-bearing increases the risk of uterine and diminishes that of mammary cancer, and it is therefore only to be expected that the present decrease in fertility should be accompanied by an increase in mammary but not in uterine cancer."

Age and Conjugal Condition in Cancer of the Generative Organs

The details of the recent English experience are given in Tables 15a to 15c of Appendix G. The data have been rearranged in a convenient form for the purpose of facilitating the comparison of the unmarried and the married. The excess in the cancer death rate of either group is indicated and the variations in the rate are shown in the manner of the rate for ages 25-29 being taken as 100. *Cancer of the ovary*, for illustration, is shown to be excessive among the unmarried at all ages excepting 80-84, when the actual numbers, however, are too small for a safe generalization. The maximum excess in the rate for the unmarried occurs at ages 55-59. Assuming the rate at ages 25-29 as 100, the rate at ages 55-59 is equivalent to 2,422, diminishing gradually towards the end of life, with the exception of ages 75-79, which must be considered accidental. The corresponding rate for the married reaches its greatest relative significance at ages 65-69, declining subsequently to the end of life.

In marked contrast are the results for *cancer of the breast*. Here it is shown that the rate is excessive for the unmarried, with the exception of ages under 35, when, however, the actual rates are of relatively small importance. Assuming the rate at ages 25-29 as 100, there is a progressive increase in the rate to the end of life; the same is true for the married, but the rise in the rate is slower and of less actual significance.

The most marked contrast, however, occurs in the case of *cancer of the uterus*. There is an excess in the death rate for the married of all ages excepting 80-84, which is probably accidental. Assuming the rate at ages 25-29 as 100, there is a rapid rise towards 50-54, after which the rate remains practically stationary to about the age 75, when there is a further rise and a subsequent decline for the unmarried, but the changes are possibly due, in part at least, to the smallness of the numbers considered at the extreme end of life. It would seem safe to conclude that the relative mortality from cancer of the uterus remains much the same during the period following the cessation of active sexual life except at the extreme ages.

These results are exceptionally interesting and of much practical usefulness. They indicate with unusual clearness the value of specialized statistical research into the more involved aspects of the cancer problem. It is to be anticipated that corresponding statistics will, in course of time, be published for at least the registration states of the United States, by the Division of Vital Statistics of the Census Office.

Mortality Experience of The Prudential Insurance Company of America

Some interesting facts regarding cancer as disclosed by the experience of a large and representative life insurance company were first exhibited by The Prudential in connection with an exhibit made at The Louisiana Purchase Exposition, in 1904. The information has been brought down to date, and the results seem to prove that the proportionate mortality from cancer is distinctly less among Industrial risks, representative of the wage-earning element, and regardless of a more rigid medical examination, distinctly higher among Ordinary risks, representative of the more prosperous and well-to-do. Considering only the age period 40-59, it appears that for males the proportionate mortality from cancer in the Company's Ordinary experience was 6.9 per cent., against 5.4 per cent. in the Industrial experience. For females the corresponding proportions were 18.7 per cent. in the Ordinary experience and 14.9 per cent. in the Industrial. Throughout, the proportionate mortality from cancer was higher among insured women than among insured men. Selecting, for illustration, the age period 50-54, it appears that in the Industrial experience of The Prudential the proportion of deaths from cancer at this period of life was 6.3 per cent. for males, against 16.6 per cent. for females. In the Ordinary experience the corresponding proportions were 8.4 per cent. for males and 19.0 per cent. for females. It is quite probable that the value of medical selection, with particular reference to cancer, is less in the case of insured women than in the case of insured men; but in view of the facts disclosed by the medico-actuarial investigation that there is a distinct value in the medical selection with reference to cancer as shown by the reduced mortality from this disease during the early years of policy duration, it would seem safe to conclude that the proportionate mortality from cancer is higher among the prosperous and well-to-do than among the wage-earning element, including the less prosperous and the poor.

The proportionate mortality from cancer in the Industrial and Ordinary experience of The Prudential is briefly summarized below:

Prudential Ordinary Mortality Experience
Mortality from Cancer, by Age and Sex, 1886-1913

	MALES			FEMALES		
Ages	Deaths from All Causes	Deaths from Cancer	Per Cent.	Deaths from All Causes	Deaths from Cancer	Per Cent.
Under 45.............	19,514	479	2.5	4,912	300	6.1
45 and over.........	13,905	1,184	8.5	2,607	464	17.8
Total............	33,419	1,663	5.0	7,519	764	10.2

Prudential Industrial Mortality Experience, White
Mortality from Cancer, by Age and Sex, 1909-1913

Ages	MALES Deaths from All Causes	Deaths from Cancer	Per Cent.	FEMALES Deaths from All Causes	Deaths from Cancer	Per Cent.
Under 15	35,822	123	0.3	30,840	85	0.3
15-44	64,296	846	1.3	60,770	2,917	4.8
45 and over	95,015	6,243	6.6	102,750	11,993	11.7
Total	195,133	7,212	3.7	194,360	14,995	7.7

The table following is a brief summary of the Industrial experience of The Prudential for the years 1909-12, showing the proportionate mortality from cancer and sarcoma by divisional periods of life, according to sex.

Prudential Industrial Mortality Experience, White
Mortality from Sarcoma and Other Forms of Cancer, by Age and Sex
1909-1912

Ages	MALES Sarcoma No. of Deaths	Per Cent.	Other Forms of Cancer No. of Deaths	Per Cent.	FEMALES Sarcoma No. of Deaths	Per Cent.	Other Forms of Cancer No. of Deaths	Per Cent.
Under 15	44	15.0	39	0.8	26	8.0	39	0.4
15-44	103	35.0	533	10.3	103	31.9	2,114	19.0
45 and over	147	50.0	4,589	88.9	194	60.1	8,985	80.6
Total	294	100.0	5,161	100.0	323	100.0	11,138	100.0

In amplification of the preceding dicussion two additional tables are included exhibiting the proportionate mortality from sarcoma and other forms of cancer for males and females in The Prudential experience, 1909-12. No corresponding information regarding the age incidence of sarcoma and its bearing upon the general mortality by divisional periods of life is available. It is conclusively shown that sarcoma is of much greater importance during early life than other forms of cancer, but the proportion to the mortality from all causes remains about the same, above age 15, and for both sexes, in marked contrast to the rapid increase in the proportion of deaths from other forms of cancer among males and females, but naturally very much more so among the latter than among the former at ages 45 and over. Of course, it is regrettable that these returns could not have been given with reference to the exposed to risk; but they sufficiently emphasize the practical importance of statistical research in this direction with reference to the mortality from cancer among the general population.

Prudential Industrial Mortality Experience, White
Proportionate Mortality of Sarcoma and Cancer to All Causes, by Age, Males
1909-1912

Ages	Deaths from All Causes	Sarcoma No. of Deaths	Per Cent.	Other Forms of Cancer No. of Deaths	Per Cent.
Under 15	28,024	44	0.16	39	0.14
15-44	50,032	103	0.21	533	1.07
45 and over	73,490	147	0.20	4,589	6.24
Total	151,546	294	0.19	5,161	3.41

Prudential Industrial Mortality Experience, White
Proportionate Mortality of Sarcoma and Cancer to All Causes, by Age, Females
1909-1912

Ages	Deaths from All Causes	Sarcoma No. of Deaths	Sarcoma Per Cent.	Other Forms of Cancer No. of Deaths	Other Forms of Cancer Per Cent.
Under 15	24,195	26	0.11	39	0.16
15-44	47,324	103	0.22	2,114	0.45
45 and over	79,622	194	0.24	8,985	11.28
Total	151,141	323	0.21	11,138	7.37

All the necessary details of this experience, by organs and parts, with data regarding age and sex, are given in Tables 4 to 7, Appendix D.

Cancer as a Life Insurance Problem

The business of life insurance within the last half-century has attained to enormous proportions. The number of policies in force with legal-reserve life insurance companies of the United States on December 31, 1914, was 40,204,119, of which 31,159,038 were on the Industrial plan. The number of new policies issued during 1914 was 8,091,175, of which 1,398,942 were Ordinary and 6,692,233 were Industrial contracts. All of the Ordinary policies and a considerable proportion of the Industrial policies are issued upon a medical examination, which has primarily for its object the elimination of risks likely to terminate by death during the early years of policy duration. Medical selection is successful in proportion to the attained reduction of mortality during the early years of policy duration, and this is especially true with regard to chronic diseases. The value of medical selection, however, is both general and special, and the benefit of such selection, with regard to cancer, has been clearly established by the several investigations to which reference has been made at some length. Cancer, by its nature, is representative of a not inconsiderable group of diseases which are extremely difficult of early diagnosis and particularly so for life insurance purposes. It is for this reason that life insurance companies are directly interested in the nation-wide effort to control a disease, which has not inappropriately been described as a scourge, in educational efforts along lines of prevention which have the approval of the foremost authorities in medical and surgical science.*

*For additional observations on cancer as a life insurance problem, see my address on "The Educational Value of Cancer Statistics to Insurance Companies, the Public and the Medical Profession," Transactions of the Clinical Congress of Surgeons of North America, 1913. See also observations on cancer in the "Text Book of Legal Medicine," by Peterson and Haines, Philadelphia, 1903, Vol. i, pp. 454-455.

CHAPTER VI

THE GEOGRAPHICAL INCIDENCE OF CANCER THROUGHOUT THE WORLD

Problems of Geographical Pathology—Recent International Statistics—Cancer Frequency throughout the World—Distribution of Cancer in the United States—Local Variations in Cancer Occurrence—Mortality from Biliary Calculi and Tumors of the Uterus and Ovaries—Increase in Cancer, by Organs and Parts, and by Age and Sex—Mortality by Season—Statistics of the New York State Pathological Institute—Previous Duration of Malignant Disease—Family History and Heredity—Primary Seat of Growth, Probable Causes, and Personal History—Geographical Pathology of Cancer by Specified Organs and Parts, throughout the World.

The ascertainment with approximate scientific accuracy of the geographical incidence of cancer throughout the world is necessarily a difficult and laborious undertaking. In a large measure such an effort at the present time must necessarily prove productive of incomplete and unsatisfactory results for a large portion of the world's surface for which trustworthy vital statistics are not available. The classical attempt on the part of Haviland, in cooperation with William Farr, in 1875, to establish with scientific exactitude the geographical distribution of cancer in females in England and Wales suggests the ideal method of statistical research, which has only been attained for comparatively small areas of countries with accurate returns of the causes of death.

Prinzing in 1908, published the results of a strictly scientific study of cancer frequency in certain administrative subdivisions of Württemberg, following an earlier study of a similarly localized excessive cancer mortality in certain portions of South Germany and adjacent parts of Austria and Switzerland.* Hirsch was one of the first to report upon the geographical and historical pathology of cancer, observing at the time

> As comprehensive a knowledge as possible of the geographical distribution of cancer of the breast and womb is much to be wished, for the sake of the light that it might throw upon the etiology of that most disastrous affliction of the female sex. But every attempted research of geographical pathology in that direction is foiled at the outset by the want of trustworthy statistics of mortality.

This was written about 1885, when most of the cancer mortality returns failed to distinguish the organs and parts of the body affected by cancerous growth. In Hirsch's work there are many useful observations, however, which may still be read to advantage.† He remarks *inter alia* that

> The impracticable state of our knowledge when an inquiry is attempted for the whole globe comes out conspicuously, not so much in the want of information as to the existence and prevalence of cancer in many parts of the world, but in the fact that in all but a few instances there is no attention paid to the frequency of the disease in the female sexual organs, or only such terms used as "common" or "rare," which are of equivocal value.

Hirsch refers to the conclusion of Haviland that cancer in the female

*Dr. Fr. Prinzing: Das Gebiet hoher Krebssterblichkeit in südlichen Deutschland und in den angrenzenden Teilen Oesterreichs und der Schweiz. Zeitschrift für Krebsforschung. 5. Band. Berlin, 1907.

†Hirsch, "Handbook of Geographical and Historical Pathology," London, 1886, Vol. iii, p. 50.

sex is rarest in England on hard rock and in high-lying places and commonest on the wet soil of river basins subject to inundations; but he questions the trustworthiness of the material used, for he points out that the generalization is opposed by the fact that in Norway cancer occurs mostly in the mountainous districts and at considerable elevations, to some extent, along the shores of the fiords, but least of all on the open coast. And he further observes that in Mexico the population living on the high table-land is more subject to cancer than the people living on the low plains. Curiously enough, in a brief discussion of the question of cancer increase, Hirsch makes use of the statistics of Frankfurt a/M., "a city which has long been noted for the completeness of its population statistics," where he claims "there has not only been no increase during the last twenty-one years in the frequency of those forms of cancer which can be most accurately diagnosed during life or after death, namely, mammary and uterine cancer, but indeed a considerable decrease when allowance is made for the fact that the population has almost doubled during that period." These conclusions, however, are not substantiated by the facts.*

Davidson in 1892 published the results of an inquiry into the geographical distribution of infective and climatic diseases, in his "Geographical Pathology," in which he gave extended consideration to the frequency of cancer in different countries of the world. The work is of considerable interest and a useful source of reference; but the results were not reduced to a uniform basis of comparison. In the main, however, they reflect the prevailing medical opinion of the period.

Clemow in 1903 published a treatise in the Cambridge Geographical Series on "The Geography of Disease," in which cancer is considered briefly and without regard to the need of uniform and strictly comparable statistics. The discussion, however, is otherwise of considerable practical value and in the main confirms the conclusions derived from other sources. Clemow emphasizes the local incidence of the disease in circumscribed areas of certain countries, and he adds many useful observations with regard to cancer frequency among native races, largely based upon the use of material not otherwise so conveniently accessible to the student of the subject.†

In none of these cancer surveys for the world as a whole has an attempt been made to consolidate the available material on the basis of standardized population estimates and fairly uniform methods of classification. W. R. Williams, in his "Natural History of Cancer," has enlarged upon the geographical aspects of the cancer problem; but his observations also are impaired in value by the non-availability of uniform data for at least the principal countries of the world and for periods of observation at least fairly coincident in point of time.

*A further attempt to substantiate the Frankfurt a/M. data by means of special statistical research brought down to date has been made by Prof. Walter F. Willcox, in an address on "The Alleged Increase in Cancer," read at the meeting of the American Public Health Association, December 2, 1914. The address has not yet been printed, and the data are therefore not available in detail; but apparently the same erroneous classification of internal and external cancers adopted by King and Newsholme was made use of, instead of the classification suggested by Bashford or the method of analysis by specific organs and parts elsewhere made use of in this work.

†In 1902 Dr. Irving Phillips Lyon, M. D., of the New York Pathological Institute made a brief investigation of the geographical distribution of Cancer in Brookfield, Madison County, N. Y., published in the Annual Report of the New York State Board of Health, 1902, as an introduction to a more comprehensive investigation, which, however, has not thus far been made. (See my "Menace of Cancer," page 31.)

Recent International Statistics

The purpose of the present work is to meet this requirement, at least in a preliminary form, as a trustworthy basis for a more comprehensive study of cancer as a problem in medical statistics. Efforts have been made in the past to bring together the cancer mortality statistics for different countries and cities, particularly in the special reports of the National Department of Statistics of France and in the Memorial Volume of the Department of Statistics of Amsterdam, prepared for the Dresden International Exposition of Hygiene. These reports, however, give only the general mortality from cancer, that is, without reference to sex, age or organs and parts of the body affected. There is a further limitation in the use of these data, in that they are in some respects wanting in accuracy, apparently, not having in all cases been derived from trustworthy official sources or been carefully compared with the data published under official authority. In the present case the statistics are, unless otherwise stated, invariably derived by actual transcript from official reports or they have been secured by direct correspondence, through the courtesy of the officials in charge of the registration of deaths. The populations have been estimated for intercensal years as far as consistent with the known facts of population progress and in a uniform manner; or when this has not been possible, a conservative estimate has been arrived at on the basis of all the available information. An effort has been made to provide at least some statistical returns for every important country of the world, or at any rate for the more important cities typical of a region, as an illustration of the local incidence of cancer as possibly determined by local conditions.

Cancer Throughout the World

More or less trustworthy mortality statistics regarding cancer are available for a population of about 450,000,000, which is approximately 26 per cent. of the entire population of the world, estimated for the year 1911. The general cancer mortality by continents, as determined on the basis of the returns for the period 1908-12, was as follows:

Mortality from Cancer
Registration Countries of the World, 1908-1912*

Continent	Population	No. of Deaths from Cancer	Rate per 100,000 Population
Africa......	9,041,866	3,018	33.4
America....	382,549,311	251,438	65.7
Asia........	272,814,962	148,447	54.4
Australasia..	27,886,740	20,345	73.0
Europe.....	1,431,996,861	1,096,716	76.6
Total.....	2,124,289,740	1,519,964	71.6

For the period under consideration there was a total population under review of 2,124,289,740 and of this number 1,519,964 died from cancer during the five-year period, a mortality equivalent to 71.6 per 100,000

*The data used in this table are, with a few exceptions, for the period 1908-12. For information in detail, see Tables 4, 217, 232, 259 and 296, Appendix G.

of population. The highest rate, 76.6, was for European countries, and the lowest, 33.4, for Africa. For the American continent the rate was 65.7, which is above the rate of 54.4 for Asia and below the rate of 73.0 for Australasia.

The statistical data are given in three separate parts: first, for the United States, second, for European countries, and third, for foreign countries other than Europe. The tables for the United States number 259, and for foreign countries 389. The tabular presentation of the data varies considerably, according to local statistical practice, which in most countries limits the returns to the cancer mortality of persons, without reference to sex. As far as practicable, the mortality by age and organs and parts is given in supplementary tables; and in the case of a few exceptionally interesting countries without vital statistics the cancer morbidity and mortality returns of hospitals are included. A seriously disturbing factor as regards comparability of rates is the occasional limitation, even in important countries, of the death registration to large cities. The practical utility of this world-survey of cancer would, however, have been much diminished if only the countries had been considered for which entirely complete statistics could be obtained. For many important countries, and even for many American States, the accurate registration of vital statistics is limited to large cities, and these are therefore made use of in the absence of more complete returns.

It has not been feasible to standardize all the crude cancer death rates for age and sex. This would have involved for many countries an amount of clerical labor which would not only have unduly delayed the publication of this work, but which in all probability would not have materially added to its scientific utility. As an illustration of the effect of such standardization for age and sex the following table is included:

Mortality from Cancer
Standardized for Age and Sex Constitution, Rate per 100,000 of Population
1906-1910

	Crude Rate	Standardized Rate
England and Wales	94	94
Netherlands	103	93
Australia	70	83
New Zealand	72	81
Austria	78	73
Prussia	74	73
Ireland	79	64
Spain	50	44
Hungary	44	43

It will be observed that the effect of such standardization for age and sex for the more important countries, such as Prussia and Hungary, is almost negligible; the effect is relatively slight for the Netherlands, Austria and Spain; while for the Australian Commonwealth and New Zealand the crude rates are increased. The most important change occurs in the case of Ireland, where abnormal conditions prevail in the age distribution, as a result of a heavy and continuous emigration.

The necessity for standardization on account of age and sex in the case of rural communities has elsewhere been discussed. For certain sections of the United States, like Vermont, for illustration, or western Massachusetts, such a standardization would be necessary to provide a strictly scientific basis of comparison. Since the cancer mortality data for practically all the important countries and cities of the world are for the first time here brought together in a comprehensive form, it should not be difficult to provide a factor for standardization generally applicable to the more scientific study of the facts, if desirable for special purposes.

Cancer Frequency in the United States

The mortality from cancer in the registration area of the United States is presented in detail in Appendix F (Part 1), in 74 tables. These are followed by 185 tables for the separate states and cities, subsequently discussed, with the required brevity, but in sufficient detail to emphasize the essentials of the cancer problem for particular localities in the United States. According to Table 2, the cancer death rate of the registration area in 1913 was 78.9 per 100,000 of population. Applied to the estimated total population of the Continental United States, this would represent an aggregate cancer mortality of 76,319; applied to the population of the year 1915, and on the assumption of a slight increase in the rate, the approximate cancer mortality for that year may conservatively be placed at 80,000. Tables 3 and 4 are for the states and cities of the registration area, followed by Tables 5 to 28, inclusive, for the separate registration states. The results for the five-year period 1908-12 are summarized in the table below; but for certain states the returns are not for the entire period.

Mortality from Cancer Standardized for Age
United States Registration Area, 1908-1912
Rate per 100,000 of Population

State	Crude Rate	Standardized Rate	State	Crude Rate	Standardized Rate
Massachusetts	93.2	83.6	Pennsylvania	65.2	67.8
Rhode Island	86.9	82.7	New Hampshire	97.2	67.8
New York	83.3	80.4	Ohio	76.4	67.4
District of Columbia	89.4	80.4	Michigan	73.9	65.0
Minnesota	68.6	74.0	New Jersey	71.8	64.5
California	84.8	72.6	Missouri	61.8	61.9
Connecticut	78.7	70.6	Indiana	70.4	61.7
Vermont	102.2	70.0	Colorado	55.8	61.0
Maine	100.7	69.8	Washington	49.5	55.8
Wisconsin	72.8	69.7	Montana	40.6	53.7
Maryland	70.3	68.3	Kentucky	43.8	48.3

Local Variations in Cancer Frequency

This table is self-explanatory and emphasizes the local variation in the cancer death rate, due, in part, to the varying age constitution of the population of the states considered. The range in *crude* rates is from a maximum of 102.2 for the state of Vermont to a minimum of 40.6 for the state of Montana, or a difference of 61.6 per 100,000 of population. When *standardized* for age the range is from 83.6 for the state of Massachusetts to 48.3 for the state of Kentucky, a variation of only

35.3 per 100,000 of population. The rates for Vermont, Maine and New Hampshire experience the greatest change by standardization, for, as is well known, these states contain a relatively high proportion of persons aged 45 and over, partly on account of the absence of large cities.* Since all cancer death rates are primarily a function of age, it is essential to keep this fact in mind; but, as previously pointed out, even when full standardization is made for variations in the age distribution of the population, wide differences in prevailing cancer death rates remain. There can therefore be no serious question of doubt that the underlying conditions responsible for maximum or minimum cancer death rates are those of the immediate environment as affected by topographical, geological, climatological, sociological, racial, occupational and numerous other conditions, which are as yet but imperfectly known and understood.

In view of the debatable borderland of malignancy and innocency in tumor formation, it has seemed advisable to include Table 29, which presents the combined mortality from malignant and benign tumors, estimated for the Continental United States on the basis of the ascertained death rate for the registration area, which for the year 1913 was 82.2 per 100,000 of population. Recalling that the estimated number of deaths from cancer for the year 1913 was 76,319, it appears by this table that the combined mortality from malignant and benign tumors for that year was 79,567.

Relative Importance of Benign Tumors

For the purpose of facilitating the study of these collateral aspects of the cancer problem, Tables 33 to 38, inclusive, present the mortality from benign tumors and certain related causes in detail for the period 1900-13, with distinction of sex and for both sexes combined. The forms of tumors and other diseases included are hydatid tumor of the liver, not specified tumors of other organs of males, tumors of the uterus and ovaries, deaths from ulcer of the stomach, biliary calculi, calculi of the urinary tract, and finally, deaths from all benign tumors combined, estimated at 3,248 for the year 1913. These tables are of unusual interest, in that they furnish the required answer to many debatable questions and the more or less doubtful interpretation of crude cancer mortality statistics. The total mortality from benign tumors, it may be said in this connection, diminished from an average rate of 4.4 in the year 1900 to 3.4 for the year 1913. This reduction may possibly be and probably is, in part, due to a transference of deaths from the benign-tumor class to the malignant-tumor class, as a result of more precise and accurate methods of laboratory diagnosis. But even when it is assumed that the entire reduction in the mortality of benign tumors was thus transferred, the number of deaths thus accounted for could have increased the mortality from cancer in the year 1913 by only 968. In contrast, deaths from ulcer of the stomach have increased since the year 1900, when the rate was 2.6, to 4.0 per 100,000 of population for the year 1913. In view of the improved diagnosis of ulcer of the stomach, it would seem quite evident that the increase in the recorded mortality has, in some cases at least,

*It may be stated in this connection that the proportion of population ages 45 and over, according to the *Census of* 1910, was 27.2 per cent. for New Hampshire, 27.1 per cent. for Maine, and 27.0 per cent. for Vermont, compared with 18.6 per cent. for Washington, 17.7 per cent. for Kentucky and 16.2 per cent. for Montana.

affected the mortality from cancer to the extent that deaths which would formerly have erroneously been diagnosed as cancer of the stomach or adjacent parts are now more correctly diagnosed as deaths from ulcer of the stomach.*

Mortality from Biliary Calculi and Tumors of the Uterus and Ovaries

Particularly significant in this connection is the recorded increase in the mortality from biliary calculi and calculi of the urinary tract. The death rate for the former is evidently excessive among females, and the increase in the rate has been greater during recent years; whereas the mortality from the latter is higher among males, but in this case also, the relative increase in the rate has been greater for women than for men.

Deaths from benign tumor of the uterus have increased from 2.6 in the year 1900 to 3.8 per 100,000 of female population in 1913, but the rate has been subject to considerable fluctuations, and on the whole may be said to have been rather stationary. Deaths from tumor of the ovaries appear to have diminished; but here also, considering the smallness of the rate, the changes have not been of material importance.

Tables 31 and 32 differentiate the mortality from cancer in the registration area of the United States by sex. For the year 1913 the male cancer death rate was 61.3 and the female rate was 97.6. The excess of the female rate of the cancer deaths for that year was therefore 36.3 per 100,000 of population, or 59.2 per cent.

Tables 41 to 46, inclusive, show the mortality from cancer by groups of organs and parts, according to sex, in conformity to the International Classification of causes of death. The results for the period 1908-12 are briefly summarized in the table below.

Mortality from Cancer, by Organs and Parts, according to Sex
United States Registration Area, 1908-1912

Organ or Part	Rate per 100,000 Population: Total	Males	Females
Buccal cavity	2.8	4.6	1.0
Stomach and liver	29.6	28.8	30.5
Peritoneum, intestines and rectum	9.5	7.7	11.3
Female generative organs	11.4	..	23.4
Female breast	7.0	..	14.3
Skin	2.8	3.5	2.1
Other or not specified organs	11.6	13.2	10.0
All organs and parts	74.7	57.7	92.6

Aggregate Mortality from Tumors

The total mortality from cancer in the Continental United States has been estimated on the basis of the actual rates by groups of organs and parts for the registration area for the year 1913. These estimates are here given only in a summary form. The details for each group for single years since 1900 are given in Table 47, Appendix F, (Part 1).

*The pathologic relationship of gastric ulcer and carcinoma has been made the subject of a special and extended investigation by the Mayo Clinic of Rochester, Minn. The evidence of such a relationship appears to have been conclusively established, as brought out by fifteen micro-photographs of specimen cases exhibited on the occasion of the meeting of the American Medical Association, Atlantic City, 1914.

Estimated Total Mortality from Cancer, by Organs and Parts Continental United States, 1913

Organ or Part	Rate per 100,000 Population	Number of Deaths	Percentage Distribution
Buccal cavity	3.11	3,007	3.94
Stomach and liver	31.23	30,215	39.59
Peritoneum, intestines and rectum	10.47	10,128	13.27
Female generative organs	12.17	11,776	15.43
Breast	7.25	7,021	9.20
Skin	2.73	2,633	3.45
Other or not specified organs	11.92	11,539	15.12
All organs and parts	78.88	76,319	100.00

Increase by Organs and Parts of the Body

The analysis in detail of these tables amply supports the conclusion not only that cancer in the aggregate is on the increase, but that there has been a rise in the recorded and specified cancer death rate in the United States for every important group of organs or parts of the body affected by malignant disease. During the period 1900-12 cancer of the buccal cavity increased from 1.6 to 3.0; cancer of the stomach and liver, from 22.5 to 30.6; cancer of the peritoneum, intestines and rectum, from 5.7 to 9.8; cancer of the female generative organs, from 8.8 to 11.7 (or on the basis of female population, from 17.5 to 24.2); cancer of the female breast increased from 4.5 to 7.2 (or on the basis of female population, from 9.1 to 14.9); cancer of the skin, from 2.0 to 2.9; but cancer of other organs and parts decreased from 17.9 to 11.7. This decrease, of course, is of considerable importance, in that practically the whole of it affects the increase in the cancer mortality of specified organs and parts; but it will be observed by reference to Table 46 that this decrease has practically come to an end since 1908, and although the total cancer death rate during this period has increased from 71.5 to 77.0, *all of this increase has fallen upon specified organs and parts*, which it is safe to assume are at the present time not subject to very material alterations in precise diagnosis, or in any event not sufficiently so to account for this considerable augmentation of the cancer death rate during so short a period as five years.

To facilitate the scientific study of the cancer death rates, the population statistics for the registration area by sex and ages are given in full detail in Table 48. This table shows separately the estimated population for the decade ending with 1912 and the two quinquennial periods ending with 1907 and 1912. Since for medical purposes cancer death rates for ages 45 and over are most useful, the aggregate population for this age period is given separately; to facilitate comparison with the English statistics by age, the divisional periods of life have been arranged in a corresponding manner, and also, of course, in conformity to the age grouping adopted by the United States Census Office.

Cancer Increase by Age and Sex

Tables 49 to 55, inclusive, present the cancer mortality of the United States registration area for the decade ending with 1912, by sex and divisional periods of life, for all forms of cancer as well as for the separate

groups of organs and parts. These tables should prove of exceptional practical utility especially in the medical study of the cancer problem, as regards the true incidence of different forms of cancer frequency according to age and sex. The results for cancer of all organs and parts of the body are summarized in the following table:

Mortality from Cancer, by Age and Sex, United States Registration Area 1908-1912

Ages	Males Rate per 100,000	Females Rate per 100,000	Excess or Deficiency in the Female Rate Compared with the Male Rate Actual	Per Cent.
Under 10	2.5	2.2	— 0.3	— 12.0
10–24	3.1	2.8	— 0.3	— 9.7
25–34	9.0	20.6	+ 11.6	+128.9
35–44	32.3	89.0	+ 56.7	+175.5
45–54	105.4	222.9	+117.5	+111.5
55–64	257.4	386.4	+129.0	+ 50.1
65–74	452.8	565.7	+112.9	+ 24.9
75 and over	620.2	734.1	+113.9	+ 18.4
All ages*	55.7	90.6	+ 34.9	+ 62.7
45 and over	236.5	366.4	+129.9	+ 54.9

*Including unknown ages.

Briefly, it is shown that the cancer mortality of females exceeds the cancer mortality of males at all ages over 24. The actual excess is most pronounced at ages 55 to 64, but the relative excess is greatest at ages 35 to 44, when the cancer mortality of females is 175.5 per cent. in excess of the cancer mortality of males. At ages 45 and over the cancer death rate of males is 236.5, but of females it is 366.4. There is, therefore, an actual excess in the female cancer death rate of 129.9 per 100,000 of population, equivalent to 54.9 per cent. The excess in the female cancer death rate is primarily due to the excessive frequency of cancer of the female generative organs and the breast.

Proportionate Cancer Mortality in the United States

The study of the subject may be approached from another point of view, but with less assurance of accuracy in the results. For certain purposes, however, the proportionate mortality is of value when the correct rate of incidence can not be determined on the basis of the existing population of corresponding ages. Table 57 has therefore been included, but the results are given only in a summary form for the five years ending with 1912, and according to sex and by five-year periods of life, subsequently summarized for ages under 15, ages 15 to 44, ages 45 to 64, and 65 and over. The proportionate mortality as determined by this method for ages 45 to 64 was 7.8 per cent. of the deaths from all causes for males, and 16.8 per cent. for females.

In a similar manner the relative mortality from cancer in comparison with that from other important causes of death has been summarized in Table 58 for ages under 45, and 45 and over, with distinction of sex. This table should prove particularly useful in discussions of public-health problems, for the purpose of visualizing the relative importance of cancer

as a leading cause of death in adult life demanding a much more active interest on the part of the medical and surgical profession and the laity than has heretofore been the case.

Cancer Mortality by Season

The cancer death rate is apparently but very slightly, at least in the United States, affected by season, or the months of the year. Table 59 has been included as a brief contribution to this phase of the cancer problem, the same being based upon the returns for the decade ending with 1911 of the states of New York, Massachusetts, New Hampshire and Connecticut. The range in the monthly cancer death rate was from a minimum of 6.3 for January and June to a maximum of 6.7 for August and October. The monthly average rate for the year was 6.5.

Details of Increase by Organs and Parts of the Body

The increase in cancer, as shown by the annual returns for the American States and the registration area as a whole, is more accurately disclosed by the specialized analysis of data for the registration area, first, for all forms of cancer according to age and sex, and second, for the six principal groups of specified organs and parts. To avoid too elaborate a method of comparison, it has been considered sufficient to limit the same to the two five-year periods ending with 1907 and 1912. The details of this analysis are set forth in Tables 61 to 74, inclusive, in a uniform manner, showing in each case the actual number of deaths from cancer and the rate per 100,000 of population by divisional periods of life. The population data used in this analysis are given in full in Table 48. These tables are of exceptional medical and surgical interest, and they will meet practically every reasonable requirement for a more adequate discussion of the statistical aspects of the cancer problem, with special reference to the United States at the present time. It has not been feasible to summarize the results of these tables, but in brief they may be said to confirm the broad conclusion that cancer is on the increase in the United States, not only when considered in the aggregate, but when every important form of cancer or organ or part of the body affected locally by malignant disease is separately considered. There are, however, probably some important exceptions to this far-reaching conclusion, which unfortunately, on account of the lack of adequate data can not be conclusively established by the statistical method at the present time. The reason for this limitation is to be found in the transfer of cancer deaths from the formerly rather large not-specified group to the groups of cancer of specified organs and parts. It may be pointed out in this connection that, regardless of a general tendency towards cancer increase, there has been a *decrease* in cancer frequency among males at ages 10 to 44 and among females at ages 25 to 54, when the rates for the five-year period ending with 1912 are compared with the rates for the five-year period ending with 1907.

The mortality from cancer of the buccal cavity remains practically the same at all age periods for males at ages under 45 and for females at ages under 55, excepting ages 10 to 24. This interesting result is probably, in part at least, attributable to the generally successful operative treatment for this form of cancer. There was either a very

slight actual increase or decrease in the mortality of both sexes from cancer of the stomach at ages under 55. This likewise is of much practical significance, and again, it is a safe conclusion that the reduction is primarily the result *not* of diminished liability to cancerous affections, but to a reduced mortality in consequence of successful operative and medical treatment. At ages 55 and over there has been a considerable increase in the mortality from cancer of the stomach and liver in recent years, and for both sexes. For males the percentage increase was 12.0, ages 55 to 64; 12.4, ages 65 to 74; and 27.3, ages 75 and over. For females the percentage increase was 14.3, ages 55 to 64; 14.4, ages 65 to 74; and 26.3, ages 75 and over. In contrast, the mortality from cancer of the peritoneum, intestines and rectum has increased for both males and females at every period of life above the age of 10. Cancer of the female generative organs has increased at every divisional period of life and cancer of the female breast at all ages over 25. It is significant that the mortality from cancer of the breast at ages under 25 should have been stationary, when deaths, though rare, are liable to occur. Cancer of the skin has increased for males at all ages, while for females the rate has shown only very slight changes at all ages under 65. The mortality from cancer by organs and parts not specified has decreased for both sexes at every divisional period of life. The correct interpretation of these statistics is rather difficult and more extended returns will be required before it will be safe to employ more refined methods of analysis; but the data seem to admit of no exception to the important and far-reaching conclusion *that the mortality from cancer of all important organs and parts, and for both sexes, has increased more or less at all ages over 50, when, of course, numerically, the mortality from malignant disease is of the greatest practical significance.*

Age Incidence of Cancer

To further facilitate the study of the age incidence of cancer frequency in the registration area of the United States, Table 60 is included. This table exhibits the crude and standardized death rates per 100,000 of population of the states included in the registration area in 1900, compared for the years 1901 and 1911, and the relative mortality for 1911, on a percentage basis, compared with that for 1901. It is shown by this table that for both sexes at ages 25 and over the cancer death rate of 1911 was 25 per cent. in excess of the rate for 1901. For males the rate for 1911 was 29 per cent. in excess, and for females, 23 per cent. This table is derived from the Census Report on mortality statistics for 1911. For all of the other tables of the United States only the original data are derived from the Census publications, the rates in every case having been recalculated and rearranged for the present purpose, so as to make the comparison uniform, as far as practicable, not only for the several states and cities, but also for foreign countries.*

Cancer Mortality Data of the New York Pathological Institute

Under an arrangement with the New York State Board of Health, the New York State Institute for the Study of Malignant Disease received†

*The mortality from sarcoma and from all other forms of cancer are given in full, by single years of life, in Appendix D, Experience Data of American and Foreign Life Insurance Companies.

†According to an official statement the cooperative arrangement between the State Institute for the Study of Malignant Disease and the State Board of Health was unfortunately discontinued subsequent to June, 1914.

a transcript of the official certificate of every death from cancer, including some additional data of special interest. The returns, more or less complete, have been received under this agreement from every county and city of the state, except Greater New York, for the year 1913.* The number of deaths from cancer returned in this manner was 2,641, of which 1,733, or 65.5 per cent., were deaths of women. A summary statement by organs and parts of the body affected is given below:

Analysis of Cancer Deaths in the State of New York (Excepting Greater New York) as Returned to the New York State Institute for the Study of Malignant Disease, 1913†

	Males		Females	
Organ or Part	Number	Per Cent.	Number	Per Cent.
Buccal cavity	92	10.1	14	0.8
Stomach and liver	400	44.1	544	31.4
Peritoneum, intestines, rectum	137	15.1	220	12.7
Female generative organs	..	..	456	26.3
Breast	5	0.5	314	18.1
Skin	56	6.2	27	1.6
Other organs and parts	218	24.0	158	9.1
Total	908	100.0	1,733	100.0

†See blank form used in Table 3, Appendix B.

The returns are classified in detail in this chapter, according to which there were 66 specified organs or parts of the body affected, the largest number of deaths of males from cancer having been due to cancer of the stomach, which accounted for 281, or 30.9 per cent. of the total deaths of males from malignant disease. Cancer of the uterus accounted for the largest number of deaths from cancer among women, or 23.1 per cent. of the total deaths from cancer of all organs and parts of the body.

The New York State investigation for the first time throws light upon the approximate previous duration of cancer, and the summary table below illustrates the general results, according to sex:

Previous Duration of Malignant Disease, according to Sex New York State Institute for the Study of Malignant Disease, 1913

	Males		Females	
Duration	Number	Per Cent.	Number	Per Cent.
Under 1 year	321	39.4	465	29.6
1 to 4 years	465	57.2	1,003	64.0
5 years and over	28	3.4	98	6.4
Total stated	814	100.0	1,566	100.0

*Of the 4,313 deaths from cancer occurring in New York state (Greater New York excluded) in 1913, returns for 2,641 were made to the New York State Institute for the Study of Malignant Disease.

Of the male deaths from cancer 39.4 per cent. show a previous duration of disease of less than one year, against 29.6 per cent. of the female deaths. The percentage of deaths with a previous disease duration of five years or more was 3.4 for males and 6.4 for females. The large majority of cancer deaths followed a previous duration of from six to twenty-four months. The average duration of previous disease was 22 months for males and 26 months for females. The New York State investigation also includes an inquiry into the previous family history of cancer. The table following briefly summarizes the results:

Family History of Cancer or Heredity
New York State Institute for the Study of Malignant Disease, 1913

	Males		Females	
Family History	Number	Per Cent.	Number	Per Cent.
Yes	104	12.5	245	16.1
No	731	87.5	1,279	83.9
Total stated	835	100.0	1,524	100.0
Not stated	73	..	209	..
Grand total	908	..	1,733	..

It is brought out by this table that definite evidence of a family history from cancer was obtained in 12.5 per cent. of cancer deaths of males, against 16.1 per cent. of cancer deaths of females. Another important result of the New York State inquiry is information regarding the microscopical examination of cancerous tissue. It was brought out that of the male cases of cancer 21.9 per cent. had been diagnosed upon the basis of microscopical findings, against 23.2 per cent. of the female cases.

Primary Seat of Growth, Probable Cause and Personal History

Some extremely interesting details disclosed by investigation regarding the primary seat of growth, the probable cause and the personal history are summarized for the more important organs, below:

Cancer of the Bladder. *Males:* 32 deaths; average age, 64 years. Primary seat of growth: bladder, 27; prostate, 4; ureter, 1. Probable cause: trauma, 4; urinary calculi, 1; enlarged prostate, 1; venereal disease, 1. Personal history: alcoholism, 6; enlarged prostate, 1; syphilis, 1; tuberculosis, 1. *Females:* 18 deaths; average age, 65 years. Primary seat of growth: bladder, 15; labia, 1; uterus, 1; urethra, 1. Probable cause: calculi, 1; cervical tear, 3; urethral carbuncle, 1.

Cancer of the Female Breast. 314 deaths; average age, 61 years. Primary seat of growth: breast, 304; axilla, 5; lung, 2; scapula, 1; uterus, 1; not stated, 1. Probable cause: trauma, 44; childbirth, 13; mastitis, 7; tumor of breast, 5; abscess of breast, 2; ulcerated nipple, 1; fissure breast, 1. Personal history: tuberculosis, 13; alcoholism, 3; syphilis, 2.

Cancer of the External Female Organs of Generation. 16 deaths; average age, 72 years. Primary seat of growth: vulva, 7; labia, 7; others, 2. Probable cause: ulcer, 2; gonorrhœal warts, 1; cervical tear, 1; prolapse uterus, 1; eczema, 1. Personal history: gonorrhœa, 1; gall-stones, 1; cystitis, 1; psoriasis, 1; diabetes, 1.

Cancer of the Gall-bladder. *Males:* 8 deaths; average age, 66 years. Primary seat of growth: gall-bladder, 8. Probable cause: gall-stones, 3; trauma, 1. *Females:* 24 deaths; average age, 68 years. Primary seat of growth: gall-bladder, 23; not stated, 1. Probable cause: gall-stones, 7; trauma, 1; gastric ulcer, 1. Personal history: cholelithiasis, 7; indigestion, 1.

Cancer of the Intestines. *Males:* 75 deaths; average age, 63 years. Primary seat of growth: intestines, 62; stomach, 4; rectum, 3; bladder, 1; liver, 1; mesentery, 1; peritoneum, 1; not stated, 2. Probable cause: trauma, 9; ulcer of stomach, 3; ulcer of intestines, 2; appendicitis, 1. Personal history: alcoholism, 12; tuberculosis, 3; constipation, 3; gall-stones, 1; hernia, 1; enlarged prostate, 1. *Females:* 166 cases; average age, 62 years. Primary seat of growth: intestines, 131; uterus, 9; stomach, 6; breast, 5; fallopian tube, 1; gall-bladder, 1; rectum, 1; ovary, 1; spleen, 1; pancreas, 1; peritoneum, 1. Probable cause: trauma, 5; appendicitis, 3; childbirth, 3; metritis, 2; typhoid, 1; ulcer, 1; mastitis, 1; gastric ulcer, 1; hernia, 1. Personal history: indigestion, 10; tuberculosis, 6; alcoholism, 1; ovarian disease, 2; hernia, 1.

Cancer of the Jaw. *Males:* 30 deaths; average age, 65 years. Primary seat of growth: jaw, 19; gums, 3; lip, 3; tongue, cheek, tooth, mouth and not stated, 1 each. Probable cause: teeth, 7; smoking, 4. Personal history: alcoholism, 8; cancer of jaw, abscess of jaw and tuberculosis, 1 each. *Females:* 7 deaths; average age, 66 years. Primary seat of growth: jaw, 5; eye, 1; nose, 1. Probable cause: ulcerated tooth, 1; smoking, 1; mole, 1. Personal history: tuberculosis, 1.

Cancer of the Kidneys. *Males:* 11 deaths; average age, 59 years. Primary seat of growth: kidney, 10; cheek, 1. Probable cause: gonorrhœa, 1; trauma, 1; abscess of kidney, 1. Personal history: alcoholism, 2; appendicitis, 1. *Females:* 3 deaths; average age, 55 years. Primary seat of growth: kidney, 3. Personal history: tuberculosis, 1.

Cancer of the Lips. *Males:* 22 deaths; average age, 74 years. Primary seat of growth: lips, 20; jaw, 2. Probable cause: smoking, 14; cut lip, 1; ulcer of lip, 1; wart, 1; tooth, 1. Personal history: alcoholism, 3; syphilis, 1.

Cancer of the Liver. *Males:* 89 deaths; average age, 62 years. Primary seat of growth: liver, 69; stomach, 6; gall-bladder, 2; testicle, 2; cheek, spleen, abdomen, rectum, eye and axilla, 1 each; not stated 4. Probable cause: trauma, 8; gastritis, 3; rich food, ulcer of stomach, lead-poisoning, gall-stones, indigestion, prostatitis and appendicitis, 1 each. Personal history: alcoholism, 12; tuberculosis, 4; syphilis, 4. *Females:* 184 deaths; average age, 63 years. Primary seat of growth: liver, 126; gall-bladder, 23; breast, 13; stomach, 6; uterus, 4; mesentery, 2; kidney, ear, pancreas, colon, rectum and ovary,

1 each; not stated, 4. Probable cause: gall-stones, 13; cervical tear, 5; trauma, 6; childbirth, 6; ulcer of stomach, 2; abscess of liver, cancer of lip, cancer of ear and ulcer of intestines, 1 each. Personal history: tuberculosis, 8; alcoholism, 5; congestion of liver, syphilis and icterus, 1 each.

Cancer of the Lungs. Males: 6 deaths; average age, 61 years. Primary seat of growth: lung, stomach, axilla and thigh, 1 each; not stated, 2. Probable cause: trauma, 3; gastric ulcer, 1. *Females:* 11 deaths; average age, 55 years. Primary seat of growth: breast, 9; shoulder, 2. Probable cause: trauma, 2; pneumonia, 1; cancer of breast, 1. Personal history: tuberculosis, 2.

Cancer of the Mouth. Males: 8 deaths; average age, 72 years. Primary seat of growth: jaw, 5; gums, 1; cheek, 1; lip, 1. Probable cause: ulcer of tooth, 5; smoking, 2. Personal history: tuberculosis, 1; eczema, 1.

Cancer of the Neck. Males: 26 deaths; average age, 63 years. Primary seat of growth: neck, 17; maxilla, 2; lip, 2; larynx, cervical gland, collar bone, parotid and skin, 1 each. Probable cause: smoking, 2; strain, 1; cat scratch, 1. Personal history: alcoholism, 7; tuberculosis, syphilis and cancer of neck, 1 each. *Females:* 5 deaths; average age, 67 years. Primary seat of growth: parotid, breast, nose, neck and sub-maxillary, 1 each. Probable cause: smoking, 1. Personal history: alcoholism, 1.

Cancer of the Œsophagus. Males: 16 deaths; average age, 58 years. Primary seat of growth: œsophagus, 13; stomach, 2; not stated, 1. Probable cause: smoking, 1; rapid eating, 1. Personal history: alcoholism, 5; paralysis, 1. *Females:* 10 deaths; average age, 64 years. Primary seat of growth: œsophagus, 8; larynx, 1; breast, 1. Personal history: tuberculosis, 1; alcoholism, 1.

Cancer of the Ovaries. 21 deaths; average age, 54 years. Primary seat of growth: ovaries, 17; breast, stomach, uterus and not stated, 1 each. Probable cause: childbirth, 4; ovarian cyst, 1. Personal history: gonorrhœa, 1; pelvic inflammation, 1; tuberculosis, 2.

Cancer of the Pancreas. Males: 18 deaths; average age, 59 years. Primary seat of growth: pancreas, 14; stomach, abdomen, liver and not stated, 1 each. Probable cause: trauma, 2. Personal history: alcoholism, 1. *Females:* 24 deaths; average age, 64 years. Primary seat of growth: pancreas, 18; gall-bladder, 1; epigastrium, 1; not stated, 4. Probable cause: gall-stones, 3; prolapse of uterus, 1; miscarriage, 1. Personal history: tuberculosis, 2; pancreatitis, 1; goitre, 1.

Cancer of the Peritoneum. Males: 6 deaths; average age, 47 years. Primary seat of growth: peritoneum, ureter, retro-peritoneal gland, testicle, mesentery and not stated, 1 each. Probable cause: trauma, 1; gonorrhœa, 1. Personal history: syphilis, 1; asthma, 1. *Females:* 6 deaths; average age, 52 years. Primary seat of growth: peritoneum, sigmoid, bladder and pelvic organs, 1 each; not stated, 2. Probable cause: perineal tear, 1. Personal history: syphilis, 1; gastritis, 1.

Cancer of the Pharynx. Males: 6 deaths; average age, 60 years. Primary seat of growth: pharynx, 2; jaw, 2; tonsil, 1; mouth, 1. Probable cause: smoking, 3; tooth-extraction, 1; ulcer of gum, 1. Personal history: alcoholism, 2.

Cancer of the Prostate Gland. 36 deaths; average age, 70 years. Primary seat of growth: prostate, 35; urethra, 1. Probable cause: prostatitis, 3; stricture of urethra, 2; trauma, 1; gonorrhœa, 1. Personal history: alcoholism, 8; sexual excess, syphilis, tuberculosis and hernia, 1 each.

Cancer of the Rectum. Males: 56 deaths; average age, 63 years. Primary seat of growth: rectum, 46; prostate, 3; lip, sigmoid, bladder and hip joint, 1 each; not stated, 3. Probable cause: piles, 5; trauma, 3; diarrhœa, 2; prostatitis, 1. Personal history: lead-poisoning, 1; alcoholism, 5. *Females:* 48 deaths; average age, 62 years. Primary seat of growth: rectum, 42; ovaries, 4; sigmoid, 1; uterus, 1. Probable cause: trauma, 4; cervical tear, 4; rectal ulcer, 1; childbirth, 2; constipation, 1; piles, 3; pruritus ani, 1. Personal history: tuberculosis, 1; diabetes, 1; uterine fibroid, 1.

Cancer of the Skin. Males: 56 deaths; average age, 71 years. Primary seat of growth: nose, 9; ear, 9; face, 7; eye, 7; cheek, 6; lip, 5; maxilla, 3; temple, mastoid, teeth and sacrum, 1 each; not stated, 6. Probable cause: trauma, 14; smoking, 3; mastitis, cleft palate, ulcer of tooth, irritation from glasses, ulcer of nose and irritation, 1 each. Personal history: alcoholism, 9; tuberculosis, 1; cataract, 1; appendicitis, 1. *Females:* 27 deaths; average age, 72 years. Primary seat of growth: nose, 8; cheek, 7; face, 3; eye, 3; scalp, 2; lip, ear, forehead and parotid glands, 1 each. Probable cause: lupus, growth on ear, picking of face, trauma and ulcer of nose, 1 each. Personal history: tuberculosis, 2; alcoholism, 1.

Cancer of the Stomach. Males: 281 deaths; average age, 63 years. Primary seat of growth: stomach, 263; œsophagus, 5; intestines, 3; spine, liver, nose, kidney, abdomen, rectum, lip, pancreas, penis and testicle, 1 each. Probable cause: ulcer of stomach, 50; trauma, 19; gastritis, 3; overeating, 1; cancer of hip, 1. Personal history: alcoholism, 48; tuberculosis, 5; syphilis, 5; indigestion, 3; stomach-trouble, 2; gall-stones, cirrhosis of liver, enlarged prostate, hepatitis, lead-colic, jaundice and hydrocele, 1 each. *Females:* 326 deaths; average age, 64 years. Primary seat of growth: stomach, 284; breast, 22; uterus, 3; intestines, face and gall-bladder, 2 each; liver, hernia, forehead, eye, kidney, mesentery, spleen, nose, pancreas, pharynx and ovary, 1 each. Probable cause: ulcer of stomach, 49; childbirth, 17; trauma, 8; alcoholism, 4; gall-stones, 2; removal of breast, 2; ulcer of leg, hernia, cancer of breast, removal of kidney and hysterectomy, 1 each. Personal history: indigestion, 15; tuberculosis, 7; gastritis, 2; typhoid fever, 2; uterine fibroid, 1; syphilis, 1.

Cancer of the Throat. Males: 16 deaths; average age, 66 years. Primary seat of growth: tongue, 3; lip, 3; larynx, 3; maxilla, 2; tonsil, palate,

cheek, œsophagus and pharynx, 1 each. Probable cause: pipe, 7; ulcerated tooth, 2; trauma, 1. Personal history: alcoholism, 5; syphilis, 1. *Females:* 5 deaths; average age, 62 years. Primary seat of growth: larynx, 2; tonsil, œsophagus and thyroid, 1 each.

Cancer of the Tongue. Males: 23 deaths; average age, 68 years. Primary seat of growth: tongue, 18; lip, 2; maxilla, 1; tonsil, 1; not stated, 1. Probable cause: smoking, 12; irritation from tooth, 3. Personal history: alcoholism, 6; syphilis, 1. *Females:* 4 deaths, average age, 55 years. Primary seat of growth: tongue, jaw, tonsil and not stated, 1 each. Probable cause: smoking, 1.

Cancer of the Uterus. 401 deaths; average age, 55 years. Primary seat of growth: uterus, 374; ovaries, 5; breast, 2; intestines, 2; round ligament, 1; not stated, 17. Probable cause: cervical tear, 141; childbirth, 54; ulcer of uterus, 5; fibroid uterus, 4; trauma, 2; ovarian cyst, previous cancer and vaginal irritation, 1 each. Personal history: syphilis, 10; tuberculosis, 7; alcoholism, 4; uterine prolapse, 4; gonorrhœa, 2; pelvic disease, 2; salpingitis, uterine laceration, cancer of breast, gall-stones, vaginal fistula, gastric ulcer and endometritis, 1 each.

Cancer of the Vagina. 11 deaths; average age, 59 years. Primary seat of growth: vagina, 9; uterus, 2. Probable cause: vaginal ulcer, operation on uterus, childbirth, tumor and irritation from pessary, 1 each. Personal history: alcoholism, 1; syphilis, 1.

Primary Seat of Growth and Other Organs and Parts Involved

The primary organs or parts affected and the number of other organs and parts involved, according to sex, for the principle organs and parts, according to the New York State investigation, were as follows:

Cancer of the Bladder. Males: 32 deaths. Other involvements: abdomen, 1; pancreas, 1; prostate, 3; rectum, 1. *Females*: 18 deaths. Other involvements: abdomen, inguinal gland, intestines and urethra, 1 each; uterus, 2.

Cancer of the Breast. Males: 5 deaths. Other involvements: liver, 1. *Females:* 314 deaths. Other involvements: arm, 3; axilla, 5; cervical glands, kidney, larynx, shoulder, skin and uterus, 1 each; intestines, 2; liver, 15; lung, 12; mediastinum and pleura, 4 each; neck and vertebra, 3 each; stomach, 11.

Cancer of the External Female Generative Organs. 16 deaths. Other involvements: bladder, glandular, liver, pelvic organs and not specified, 1 each; inguinal gland, 4.

Cancer of the Gall-bladder. Males: 8 deaths. Other involvements: intestines, 1; liver, 6. *Females:* 24 deaths. Other involvements: intestines and stomach, 2 each; liver, 12.

Cancer of the Intestines. Males: 75 deaths. Other involvements: bladder, peritoneum and stomach, 1 each; liver, 5. *Females:* 166 deaths. Other involvements: abdomen, femur, liver, mediastinum and ovaries, 1 each; bladder and rectum, 2 each; stomach, 7; uterus, 4.

Cancer of the Liver. *Males:* 89 deaths. Other involvements: intestines, pancreas, rectum, spleen, testis and thorax, 1 each; stomach, 5. *Females:* 184 deaths. Other involvements: brain, lung, pancreas, peritoneum and uterus, 1 each; breast, 4; gall-bladder, 3; intestines, 13; stomach, 5.

Cancer of the Lungs. *Males:* 6 deaths. Other involvements: lower extremity, stomach and thorax, 1 each. *Females:* 11 deaths. Other involvements: axilla, mediastinum, pleura and spleen, 1 each; breast, 3.

Cancer of the Mouth. *Males:* 8 deaths. Other involvements: jaw and stomach, 1 each; throat, 3. *Females:* 1 death. Other involvements: antrum, 1.

Cancer of the Ovaries. 21 deaths. Other involvements: intestines, 4; pelvic organs (not specified), pleura, rectum and uterus, 1 each.

Cancer of the Pancreas. *Males:* 18 deaths. Other involvements: intestines, spleen and stomach, 1 each; liver, 2. *Females:* 24 deaths. Other involvements: gall-bladder, intestines, liver and stomach, 1 each.

Cancer of the Rectum. *Males:* 56 deaths. Other involvements: bladder and intestines, 3 each; liver, 2. *Females:* 48 deaths. Other involvements: bladder, 2; breast, intestines, liver, pelvis, peritoneum, stomach and vagina, 1 each.

Cancer of the Skin. *Males:* 56 deaths. Other involvements: eye, intestines, neck, prostate gland and throat, 1 each. *Females:* 27 deaths. Other involvements: eye and throat, 1 each.

Cancer of the Stomach. *Males:* 281 deaths. Other involvements: intestines, 5; liver, 26; neck, 1; œsophagus and pancreas, 2 each. *Females:* 326 deaths. Other involvements: breast, lung, pancreas and pelvic organs (not specified), 1 each; femur and intestines, 2 each; liver, 21; uterus, 3.

Cancer of the Tongue. *Males:* 23 deaths. Other involvements: jaw and mouth, 1 each; pharynx and throat, 2 each. *Females:* 4 deaths. Other involvements: mouth and skin, 1 each.

Cancer of the Uterus. 401 deaths. Other involvements: abdomen, 2; bladder and ovaries, 5 each; breast, external female organs of generation, kidney and throat, 1 each; intestines, liver and pelvis, 3 each; rectum, 9; stomach, 7.

Cancer of the Vagina. 11 deaths. Other involvements: ovaries and rectum, 1 each; pelvis, 2; uterus, 3.

The results of this investigation are for the time being of limited value, on account of the paucity of the data considered; but the method employed suggests the direction which inquiries of this kind should take to establish with greater accuracy certain special but fundamental numerical facts of the cancer problem.*

*The blank used by the New York State Institute for the Study of Malignant Disease is given in Appendix B. All the observations and conclusions regarding the data collected by the New York State Institute for the Study of Malignant Disease are based upon this analysis, made under my personal direction, of the original records loaned for this purpose by the Institute through the kindness of Dr. H. R. Gaylord and his associates.

Geographical Pathology of Cancer by Organs and Parts

The cancer death rate varies so widely throughout the civilized world that the argument is frequently advanced that the rate of frequency is primarily determined by the accuracy and completeness of death registration; in other words, a low cancer death rate is assumed to be evidence rather of a backward state of medical practice or a disregard of fundamental requirements in the registration, tabulation and analysis of vital statistics. Yet it is perfectly well known that certain forms of cancer prevail in some parts of the world which are practically unknown in other parts and that certain types of malignant disease are quite common in certain occupations and absolutely unknown in others. It is, therefore, a valid assumption that there may be local reasons for cancer rarity or cancer frequency, irrespective of the always important question as to whether the registration of deaths is both accurate and complete. Kangri cancer is practically unknown outside of a comparatively circumscribed area of Asia; cancer of the cheek, attributed to the chewing of the betel nut, is extremely rare outside of India; cancer of the male generative organs is common in that country, but very rare in Europe and America; chimney-sweeps' cancer is practically limited to the United Kingdom; Roentgen-ray cancer is entirely limited to X-ray workers, etc. These forms of cancer are all comparatively easy of accurate diagnosis, but they forcibly emphasize the conclusion that not only is cancer invariably, to begin with, a strictly local affection, but that certain forms and possibly all types of malignant disease may be determined by local conditions, or what is generally comprehended under the term *environment*. There are no reasons known why cancer should not be comparatively rare among native races; but many reasons exist why cancer should be relatively common among the peoples of civilized nations, living more or less under artificial conditions of existence. A low cancer death rate is, therefore, not an inherent improbability or necessarily evidence of faulty diagnosis or imperfect death registration. The statistical evidence in support of this conclusion is extremely interesting and, as far as known, the facts have not heretofore been brought together in a convenient form.*

A comparative study in detail of the geographical pathology of cancer throughout the world, by specified organs and parts of the body, would be impracticable and possibly inconclusive at the present time. The returns for certain organs and parts, however, are quite comparable for the principal countries of the world, and for the present purpose, cancer of the stomach, including the liver and the œsophagus, cancer of the skin, cancer of the female generative organs and of the female breast have been selected to illustrate the wide range in variation of cancer

*As an additional illustration of the relatively higher degree of cancer frequency among the well-to-do, reference may be made to the recently published statistics of the city of Edinburgh, Scotland. Grouping the deaths from cancer and from tuberculosis according to the rental paid for the houses in which the deaths occurred, it appears that as regards cancer 35.9 per cent. of the deaths occurred in houses with the highest rental (over $100 a year), 37 per cent. occurred in the houses with the moderate rental ($50 to $100 a year) and 21.8 per cent. occurred in the houses with the lowest rental (less than $50 a year). In contrast, the distribution of deaths from tuberculosis, which is largely a disease of poverty, was as follows: 17.9 per cent. of the deaths occurred in the houses with the highest rental; 34.6 per cent. in the houses with the moderate rental, and 36.4 per cent. in the houses with the lowest rental; in other words, over one-third of the cancer deaths occurred among the well-to-do, against less than one-fifth of the deaths from tuberculosis among this class. The data emphasize the practical utility of further statistical research of the relation of housing and economic conditions to cancer frequency.

frequency, according to organs and parts, and their effect upon the general cancer death rate without such reference to the part of the body affected by malignant growth. The specific cancer death rates have been calculated upon an average population for not less than five years, ending, unless otherwise stated, with 1910. The mortality from cancer of the stomach, liver and œsophagus and from the skin are given for both sexes combined; but for cancer of the female generative organs and of the female breast the rates are based upon the female population only.

The relative frequency of cancer of the stomach, liver and œsophagus, combined, for thirteen of the principal countries of the world is shown in the following table, according to which, the highest rate for this form of cancer prevailed in Switzerland, or 70.4 per 100,000 of population, and the lowest in Cuba, or only 12.7. The United States occupies quite a favorable position, with a rate of only 28.3.

Comparative Frequency of Cancer of the Stomach, Liver and Oesophagus in Thirteen Countries of the World, 1906-1910
Rate per 100,000 of Population

Switzerland	70.4	Uruguay	35.6
Holland	62.2	England and Wales	31.4
Norway	61.4	Ireland	31.0
Bavaria	59.4	United States Registration Area	28.3
Japan*	40.0	Australian Commonwealth†	27.4
Scotland	36.0	Italy	26.2
		Cuba†	12.7

*1909-1910.
†1908-1912.

The international contrast presented by this table is one of unusual interest. Cancer of the stomach, liver and œsophagus, combined, causes from 30 to 60 per cent. of the mortality due to cancer of all organs and parts. If the theory is sound that erroneous diagnosis primarily determines a low cancer death rate, then it would seem that considering cancer of the stomach and adjacent organs or parts strictly within the inaccessible group, diagnosis must be erroneous to a large extent in countries which have otherwise a high and well-deserved reputation for medical and surgical skill. It is shown, for illustration, by the preceding table that the relative mortality from cancer of the stomach, liver and œsophagus was higher in Uruguay and Japan than in the United States Registration Area and England and Wales! Furthermore, it is brought out that the rate for this group of cancers was more than twice as high in Switzerland, Holland, Norway and Bavaria as in the United States Registration Area! It would certainly seem to be going too far to maintain that the practice of medicine or the development of diagnostic skill or the accuracy of death certification is so considerably superior in Uruguay, Japan, Bavaria, Norway, Holland and Switzerland as to account for the wide disparity between the recorded mortality from cancer of the stomach and adjacent parts in these countries and the United States, Australia and Italy.

An equally interesting though less striking comparison is presented in the next table, for cancer of the skin. This comparison is limited to eleven countries, since the returns could not be obtained for Norway and Italy.

Comparative Frequency of Cancer of the Skin in Eleven Countries of the World, 1906-1910
Rate per 100,000 of Population

United States Registration Area	2.7	Switzerland	1.9
Ireland	2.7	Scotland	1.7
Australian Commonwealth*	2.3	Holland	1.4
England and Wales	2.1	Uruguay	1.1
Cuba*	2.0	Bavaria	0.8
		Japan†	0.7

*1908-1912. †1909-1910.

The highest recorded mortality from cancer of the skin, 2.7 per 100,000 of population, is for the United States Registration Area and Ireland, followed by a rate of 2.3 for the Australian Commonwealth, 2.1 for England and Wales, 2.0 for Cuba and 1.9 for Switzerland. The lowest rate for this form of cancer, 0.7, prevailed in Japan; the rate in Bavaria, was 0.8, and in Uruguay, 1.1. When the argument in regard to erroneous diagnosis as measured by a low recorded cancer death rate is applied to cancer of the skin, it would appear that Scotland, Switzerland and Japan occupy a distinctly unfavorable position as regards accessible cancer, but a decidedly favorable one as regards the apparent efficiency in the diagnosis of the inaccessible forms of cancer of the stomach, liver and œsophagus. Such a conclusion requires only to be stated to emphasize its inherent improbability.

The same method of reasoning can be successfully applied to the two forms of cancer most common to women, that is, cancer of the generative organs and of the breast. The former is largely internal or inaccessible, whereas the latter is among the most conveniently accessible and easily diagnosed forms of malignant disease. The comparative frequency of cancer of the female generative organs for thirteen of the principal countries is shown in the following table:

Comparative Frequency of Cancer of the Female Generative Organs in Thirteen Countries of the World, 1906-1910
Rate per 100,000 of Female Population

England and Wales	24.2	Cuba†	18.9
United States Registration Area	22.1	Italy	16.0
Bavaria	21.6	Australian Commonwealth†	15.5
Switzerland	21.4	Holland	13.2
Japan*	20.9	Ireland	12.8
Scotland	20.6	Uruguay	12.2
		Norway	11.5

*1909-1910. †1908-1912.

The highest rate for cancer of the female generative organs in the group of countries represented in the table is shown to prevail in England and Wales, or 24.2, followed by the United States Registration Area with a rate of 22.1, and Bavaria with 21.6. The lowest rates are shown to prevail in Norway, 11.5, Uruguay, 12.2, and Ireland, 12.8. In the comparative table for cancer of the stomach, liver and œsophagus, the Norwegian rate was the third highest, whereas in the present comparison the rate for Norway is the lowest of the thirteen countries represented. If, therefore, the argument were sound that a low cancer death rate must be considered evidence of imperfect diagnostic skill or defective methods of death registration, Norway would rank first in regard to the diagnosis of cancer of the stomach, liver and œsophagus, and last in

regard to the diagnosis of cancer of the female generative organs. The same conclusion would apply to Holland. It would further follow that since the rate for Scotland was 20.6 and for Japan 20.9, the diagnosis of cancer of the female generative organs was about equally well developed in these two countries; but as subsequently shown, this conclusion would not hold at all for the much more easily diagnosed form of cancer of the female breast. The comparative frequency rates for cancer of the female breast for thirteen representative countries of the world are given in the table following:

Comparative Frequency of Cancer of the Female Breast in Thirteen Countries of the World, 1906-1910
Rate per 100,000 of Female Population

England and Wales	17.9	Holland	9.6
Scotland	15.4	Bavaria	9.1
Ireland	14.0	Norway	7.3
Switzerland	13.6	Italy	5.8
United States Registration Area	13.3	Cuba*	4.5
Australian Commonwealth*	10.6	Uruguay	3.7
		Japan†	1.8

*1908-1912. †1909-1910.

The highest frequency rate for cancer of the female breast of the thirteen countries included in the comparison prevailed in England and Wales, the rate being 17.9. The next highest rate, 15.4, prevailed in Scotland, followed by a rate of 14.0 for Ireland, of 13.6 for Switzerland and of 13.3 for the United States Registration Area. The lowest rate prevailed in Japan, being only 1.8, followed by 3.7 for Uruguay, 4.5 for Cuba, 5.8 for Italy and 7.3 for Norway. The rate for Italy of 5.8 is less than one-half the rate of 13.3 for the United States Registration Area.

For cancer of the female generative organs the rates are not far apart for England and Japan, whereas for cancer of the female breast the English rate is *nearly ten times the recorded rate for Japan.** It thus appears that the two forms of cancer diagnosed with difficulty, on account of inaccessibility, that is, cancer of the stomach, liver and œsophagus and cancer of the female generative organs, are diagnosed as well, or even better, in Japan as in England and Wales, whereas the two most accessible forms of cancer, i. e., cancer of the skin and of the female breast, are apparently diagnosed with a much lesser degree of accuracy in Japan than in England and Wales. This conclusion requires only to be stated to bring out its inherent improbability, and yet, by inference, the same argument applies to the broad generalizations in regard to the crude cancer death rate without reference to organs or parts, which for the present purpose, however, has been subjected to further analysis, to establish the fundamental truth *that the local variations in cancer frequency throughout the world are primarily conditioned by local causes and not by faulty methods of diagnosis or defective methods of death registration.* The statistical data upon which these conclusions are based are given in Table 4, Appendix E, which will facilitate the further study of this important phase of the cancer problem.

*During a visit to Hawaii I made careful inquiry among practically all the leading physicians regarding the occurrence of cancer of the breast among Japanese women, and the answer was invariably to the same effect, that this form of malignant disease was extremely rare among them. The number of Japanese women ages 25 and over in Hawaii in 1910 was 11,802. Out of 33 deaths from cancer among the Japanese of both sexes during the two years ending June 30, 1913, not a single death was from cancer of the breast.

CHAPTER VII

THE STATISTICAL DATA OF CANCER FREQUENCY IN AMERICAN STATES AND CITIES

Limitations of Crude Statistics—Progressive Increase in the Cancer Death Rate—Mortality in Large American Cities—Sources of Errors—Range in Cancer Death Rates—Comparative Mortality Rates by Organs and Parts—Comparative Mortality Rates by Age, Sex and Race—Cancer among Mexicans.

The geographical distribution of cancer throughout the United States by separate states and cities is presented in 185 tables. All of these have been derived from official sources, and as far as practicable they have been made to include the essential details of sex, race and organs and parts of the body affected. For many states and cities this information in detail is not available, but sufficient data have been brought together to establish the salient statistical facts of the cancer mortality problem in the United States at the present time. As a rule, the statistics have not been carried further back than 1871, since for most of the cities the data are available only for comparatively recent periods. The statistics by states are limited to the New England States, New York and New Jersey, and a table is included presenting the combined mortality for this group of states since 1886 (Table 21, Appendix F, Part 2). For Massachusetts, however, the returns are given since 1856, so as to facilitate the historical study of the cancer problem by means of data which are generally accepted as approximately correct for the earlier period.

The statistics for forty-one American cities are sufficient to emphasize the great practical importance of cancer as an urban mortality problem. For certain cities the available information is naturally much more complete than for others; but it would have unduly enlarged this work and the necessary discussion if all the available facts of cancer mortality, by organs and parts as well as by age, sex and race, had been given in full for the large number of American cities which in 1910 had a population of 30,000 or more. The information omitted would have been largely cumulative evidence, and though useful for local purposes of cancer research, it would obviously be a practical impossibility to include in a work of this kind the entire statistical material of cancer mortality, not only of the United States and its subdivisions, but also of all the other countries of the world. It would have been even more difficult, if not impossible, to briefly and accurately summarize and discuss the large amount of statistical material presented in tabular form for purposes of convenient reference and further study and research.

Limitations of Crude Statistics

There are also many practical limitations which affect the correct interpretation of crude local cancer death rates. *All such data, unless standardized for age and sex, require to be used with caution in efforts to illustrate the comparative frequency or infrequency of cancer in the different sections or cities of the United States.* Occasionally large institutions,

such as hospitals, almshouses, asylums for the insane, soldiers' homes, etc., substantially increase the local cancer death rate, which in such cases requires to be standardized, at least for age, if misleading conclusions are to be avoided. When due allowance, however, is made for all the factors which affect the practical utility and accuracy of cancer mortality statistics, there remains no question of reasonable doubt that on the whole the available data are fairly comparable and that they are an approximately accurate indication of local variations in cancer frequency.

Progressive Increase in the Cancer Death Rate

Considering, first, the combined cancer mortality statistics of the New England States and New York and New Jersey since 1886, the data are set forth with the required brevity in the following table, by quinquennial periods down to 1910 and thereafter by single years.

Mortality from Cancer in the New England States, New York and New Jersey, 1886-1913

Years	Population	Deaths from Cancer	Rate per 100,000 Population	Relative Rate 1886-1890 Being 100
1886–90	55,320,449	26,215	47.4	100.0
1891–95	64,879,439	34,536	53.2	112.2
1896–00	71,405,669	44,645	62.5	131.9
1901–05	78,132,762	55,501	71.0	149.8
1906–10	87,343,060	69,140	79.2	167.1
1911	18,699,051	15,980	85.5	180.4
1912	18,976,968	16,640	87.7	185.0
1913	19,327,238	17,385	90.0	189.9

The progressive increase in the cancer death rate of a large and contiguous area in the United States is concisely shown by this table. The details by single years are given in Table 21, Appendix F, Part 2. The average cancer death rate of this area, which in 1913 contained a population of more than 19,000,000, has increased from 47.4 during the five years ending with 1890 to 79.2 during 1906-10 and to 90.0 during the year 1913. A similar upward tendency of the cancer death rate is disclosed by the combined experience of twenty large American cities since 1881, which in 1913 had a population of 13,400,000. A summary of the data is given in the table below:

Mortality from Cancer in Twenty Large American Cities, 1881-1913

Years	Population	Deaths from Cancer	Rate per 100,000 Population	Relative Rate 1886-1890 Being 100
1881–85	30,328,347	14,735	48.6	95.9
1886–90	35,302,944	17,884	50.7	100.0
1891–95	40,912,510	22,513	55.0	108.5
1896–00	47,016,267	28,533	60.7	119.7
1901–05	53,386,935	37,127	69.5	137.1
1906–10	60,116,913	47,701	79.3	156.4
1911	12,849,687	10,713	83.4	164.5
1912	13,125,121	11,203	85.4	168.4
1913	13,400,553	11,971	89.3	176.1

According to this table and the details by single years, as given in Table 22, Appendix F, Part 2, the cancer death rate of twenty large American cities increased from an average rate of 50.7 during the five years ending with 1890 to 79.3 during the five years 1906-10 and, further still, to 85.4 during the year 1912 and to 89.3 during the year 1913.

Cancer Mortality of Southern Cities

In Southern cities the cancer death rate of the white population increased from an average of 52.7 during the period 1891-95 to 96.6 in 1913. The corresponding increase in the negro cancer death rate during this period was from 39.1 to 73.5. The relative increase in the rate for the white population of Southern cities was 83.3 per cent., in comparison with an increase of 88.0 per cent. for the negro population.*

Mortality of Large American Cities

In the table following, the principal American cities for which the information is available are arranged in the order of their recorded cancer mortality frequency for the five-year period ending with 1910. The details for these cities are given in Appendix F, Part 2, and it is only necessary to call special attention to the fact that, on account of their local importance, the two subdivisions of the combined Boroughs of Manhattan and Bronx and of Brooklyn have been included, in addition to the rate for Greater New York.

Cancer Mortality Rates of American Cities, 1906-1910
Rates per 100,000 of Population

City	Average Rate	City	Average Rate
San Francisco	102.5	Newark	76.9
Boston	99.4	Chicago	76.5
Providence	96.9	Greater New York	74.1
Los Angeles	94.9	Richmond	73.9
Cincinnati	93.0	Kansas City (Mo.)	71.1
Hartford	91.9	St. Paul	71.1
New Haven	89.8	Indianapolis	70.4
Dayton	88.5	Boro. of Brooklyn	68.9
Rochester	88.2	Milwaukee	68.4
Springfield (Mass.)	86.9	Nashville	68.0
District of Columbia	86.0	Pittsburgh	66.4
Baltimore	85.8	Minneapolis	65.3
Omaha	85.7	Detroit	64.5
Buffalo	84.0	Cleveland	62.9
New Orleans	82.2	Louisville	61.1
Philadelphia	81.9	Jersey City	60.5
Hoboken	80.7	Charleston	53.6
Columbus	79.5	Seattle	50.2
Boro. of Manh. and Bronx	78.4	Augusta (Ga.)	49.1
St. Louis	78.4	Memphis	48.7
Denver	77.9	Savannah	47.1

*The ethnological aspects of the cancer problem, with special reference to the American negro, are briefly discussed in the third volume of the cancer treatise by J. Wolff. The data used, however, are inadequate to the purpose. The same conclusion applies to the brief references to the negro cancer death rate in the recent work on the cancer problem by Dr. Seaman Bainbridge. For some exceedingly interesting observations on cancer frequency among the negro population, see article by Dr. Rudolph Matas in the "System of Surgery," by Dr. Frederick S. Dennis. Also "Observations on tumor formation in white and colored races compared," by Rudolph Matas, M.D., in "The Surgical Peculiarities of the American Negro," Transactions of the American Surgical Association, 1896.

Sources of Statistical Errors

It has not been feasible to standardize these rates for variations in the age and sex distribution of the populations. The liability to error in this respect is less serious than the local increase in cancer death rates resulting from admissions to hospitals of cancer patients from surrounding and even remote localities.* It is unfortunate that at the present time such deaths are not redistributed in the final tabulations of mortality according to the residence of the deceased. Such a correction is particularly called for in the case of cities which provide exceptional institutional facilities for the treatment of malignant disease. It, however, is a reasonably safe assumption that this factor of error is not of as much importance as is often assumed to be the case.† In a strictly scientific study of the local incidence of cancer a redistribution of the deaths according to the residence of the deceased is, of course, required. The present state of our American vital statistics, however, does not afford the means for such a redistribution in the general mortality returns, and they have, therefore, to be accepted as published, subject to the foregoing words of caution, which apply to practically the entire statistical material presented in this work.

A striking fact disclosed by the preceding table of cancer mortality rates of American cities is the wide range between the maximum of 102.5 for San Francisco and the minimum of 47.1 for Savannah. The rates are necessarily affected by the age and sex distribution of the population, but for general purposes they are useful in providing an approximate index of local cancer frequency. Where the female population is decidedly in excess of the male population, it is obvious that the crude death rate, unless standardized for sex, would be misleading, since as a rule the cancer death rate of males is considerably below the cancer death rate of females. In Boston, for illustration, the male cancer death rate is 75.2, whereas the cancer death rate of females is 126.5 (Tables 35 and 36, Appendix F, Part 2). The same conclusion applies to the element of race, which in part accounts for the relatively low cancer rates of certain Southern cities. For Charleston, S. C., for illustration, the cancer death rate of the white population is 73.2, whereas for the colored population the rate is only 36.6 (Tables 44 to 46, Appendix F, Part 2). The crude death rate for both races combined is therefore reduced by the large proportion of negro population, and the rates are required to be considered separately for the two races, if erroneous conclusions are to be avoided. It is hardly necessary to point out in this connection that the mortality returns for the negro population are intrinsically less trustworthy than those for the white population, in view of the relatively low professional status of the negro physicians and the comparatively high proportion of deaths among the negro population without proper medical attendance.

Comparative Cancer Mortality by Organs and Parts of the Body

As an illustration of the most convenient method available in the

*This conclusion applies with special force to the city of Boston, where the Massachusetts General Hospital tends to increase the local cancer death rate by the admission of cancer patients not only from the immediately surrounding territory, but even from other New England States and still more distant parts of the country.

†See remarks, on page 144, on Cancer Frequency according to Size of Cities.

comparative study of cancer frequency by organs and parts and according to sex, the following two summary tables are inserted, for the city of Boston for the period of 1903-12 and the city of San Francisco for the period 1906-13.

Mortality from Cancer in Boston, Mass., by Organs and Parts according to Sex, 1903-1912

TOTAL			MALES		FEMALES	
Organ or Part	Deaths	Rate per 100,000 Population	Deaths	Rate per 100,000 Population	Deaths	Rate per 100,000 Population
Buccal cavity	308	4.9	248	8.0	60	1.9
Stomach and liver	2,027	31.9	918	29.5	1,109	34.2
Peritoneum, intestines and rectum	1,127	17.7	446	14.3	681	21.0
Female generative organs	921	14.5	..	..	921	28.4
Breast	657	10.3	7	0.2	650	20.1
Skin	82	1.3	44	1.4	38	1.2
Other or not specified organs	1,318	20.7	679	21.8	639	19.7
All organs	6,440	101.3	2,342	75.2	4,098	126.5

Mortality from Cancer in San Francisco, Cal., by Organs and Parts according to Sex, July 1, 1906, to June 30, 1913

TOTAL			MALES		FEMALES	
Organ or Part	Deaths	Rate per 100,000 Population	Deaths	Rate per 100,000 Population	Deaths	Rate per 100,000 Population
Buccal cavity	186	6.5	172	10.6	14	1.1
Stomach and liver	1,377	48.0	878	54.1	499	40.1
Peritoneum, intestines and rectum	442	15.4	223	13.7	219	17.6
Female generative organs	406	14.2	..	..	406	32.6
Breast	253	8.8	1	0.1	252	20.2
Skin	67	2.3	41	2.5	26	2.1
Other or not specified organs	468	16.4	336	20.8	132	10.6
All organs	3,199	111.6	1,651	101.8	1,548	124.3

Inadequacy of Existing Data

It is regrettable that information regarding the local cancer problem should not be available in this form for all of the cities considered. Obviously the local study of cancer in its final analysis reduces itself to the separate consideration of cancer frequency, by organs and parts, according to sex, race and age. Such an extended statistical analysis, however, results in extremely complex problems of the precise correlation of the statistical conclusions to the medical, anthropological, environmental and even sociological considerations which affect the cancer problem. It will probably not be found feasible to provide much more than a complete statistical analysis of the cancer mortality

of the larger states and cities and of course for the registration area of the United States as a whole.* The admirable consideration of the statistical details of the cancer problem, with special reference to the requirements of modern cancer research, in the Annual Reports of the Registrar-General for England and Wales may be referred to as suggestive of the method most likely to produce results of practical utility. In view of the enormous extent to which minute pathological researches have been carried in the more or less illusive hope of ascertaining a cancer cause and a cancer cure, it would seem but reasonable to insist upon more extended but thoroughly qualified statistical research than has heretofore been the case and the gradual replacement of crude and even misleading data with returns of unquestioned accuracy and conclusiveness made available for critical and minute analysis.

Comparative Cancer Mortality Rates by Age, Sex and Race

No aspect of the cancer problem from the statistical point of view has been more neglected than the age factor, which is fundamental in every statistical discussion of the cancer mortality problem. Only a few American cities provide the necessary information of cancer mortality by age and sex, and only a very few furnish the absolutely essential additional information of cancer mortality by age, sex and organs and parts. The table following† is suggestive of the practical value of statistical analysis of cancer by age, sex and race; but in Appendix F, Part 2, numerous tables are included which further illustrate the age incidence of cancer by organs and parts:

Mortality from Cancer in the District of Columbia, U. S. A., 1901-1910 by Age, Sex and Race, Rate per 100,000 of Population

	WHITE		COLORED	
Ages	Males	Females	Males	Females
Under 10	1.7	0.6	..	2.7
10–19	4.2	1.7	..	1.1
20–29	5.8	3.1	9.7	13.1
30–39	23.2	56.0	26.3	72.3
40–49	62.5	162.2	48.7	207.3
50–59	182.4	347.3	139.6	328.9
60–69	413.7	456.4	310.1	386.6
70 and over	610.6	556.9	335.1	522.1
All ages	70.6	104.8	38.6	86.5
40 and over	217.1	312.0	130.2	293.9

The value of specialized cancer research has been well brought out by Bashford in his observations on the differential age incidence of sarcoma and carcinoma.‡ The variations in cancer incidence by age, sex

*Such an analysis of cancer mortality in detail is contemplated by the Division of Vital Statistics of the United States Census for the year 1914. The same is to be published as a monograph apart from the annual report on the mortality of the registration area as a whole.

†For a more extended discussion of the cancer statistics of the District of Columbia, see my "Menace of Cancer" published in the Transactions of the American Gynecological Society, 1913. (See also Tables 132 to 136, Appendix F, Part 2.)

‡The age incidence by single years of life in sarcoma and carcinoma is given in detail in the Prudential Industrial Mortality Experience data appended to the chapter on Cancer as a Problem in Life Insurance Medicine, Tables 8 to 15, Appendix D.

and race, with particular reference to organs and parts, are so numerous, so perplexing and so frequently conditioned by special circumstances that extreme caution is invariably necessary in utilizing the data for practical purposes. At the same time, it would seem that special research in this direction gives promise of revealing much that is new in the scientific study of the cancer problem; for there can be no serious question of doubt that the variations in frequency are real and not apparent, are more often the result of local conditioning circumstances than of errors in statistical tabulation and analysis or a matter of pure chance. For illustration, almost every table by organs and parts exhibits a distinctly higher mortality of cancer of the buccal cavity among males than among females and as a rule a higher mortality from cancer of the peritoneum, intestines and rectum among women. Without exception the general cancer mortality in the United States is higher for the white population than for the negro, regardless of latitude and longitude, and the fact that as a broad principle the two races are living under much the same conditions, with a constant approach towards equality in all that ministers to the needs of the body, somehow or in some way affects nutrition and metabolism, in brief, development and growth.*

Cancer among Mexicans

The mortality from cancer among Mexicans in the United States has not been made the subject of an extended investigation. It has seemed, however, advisable for the present purpose to make an original analysis of the mortality returns for San Diego and Los Angeles, California, and El Paso and San Antonio, Texas, for the period 1910-14. Out of 2,935 deaths of Mexican males, ages 15 and over, 91, or 3.1 per cent., died from cancer. The corresponding proportion of deaths from cancer among 2,419 Mexican females was 144, or 6.0 per cent. At ages 15-44 the proportionate mortality from cancer was 1.6 per cent. for males and 3.7 per cent. for females; and at ages 45 and over, 5.1 per cent. for males and 9.1 per cent. for females. The proportionate mortality is higher than expected, considering the rather simple mode of life and the peculiar diet of this class of people. The Mexican element of the southwest is chiefly of the peon class with a fair degree of intermixture with the Indians of Northern Mexico. For the City of Mexico the average cancer death rate is 53.1, which compares with a rate of 74.1 per 100,000 for the city of New York.

*In this connection the following observations and conclusions by Dr. Rudolph Matas, in his treatise on "The Surgical Peculiarities of the American Negro," are of special interest and practical importance. Dr. Matas concludes: "1. That the tendency to the formation of neoplastic tissue whether purely hyperplastic or heteroplastic is greater in the negro than in the white race. 2. That the typical mesoblastic derivatives of the adult connective tissue group are especially prone to develop in the negro. 3. That of this group, the fibroma and cicatricial keloid preponderate sufficiently to give to the black race a striking pathological peculiarity. 4. That the mesoblastic derivatives of the embryonal connective tissue type, i. e., the sarcomata, are also apparently more frequent in the negro with the sole exception of the melanotic sarcomas, which are rare. 5. That contrary to the generally accepted belief, the epiblastic derivatives of embryonal type, or the true cancers, appear, statistically at least, to be even more common than in the white race. 6. That in regard to the malignant neoplasms the negro constitution has probably undergone some change under the conditions of American civilization, since it cannot be doubted that cancer is comparatively rare in the native African, rare also in the original slave population in this country, and has only become a common disease in the American negro of the last few generations. It is also probable that the conditions that are causing an increase in the prevalence of cancer among the whites are also acting with the same effect upon the negroes."

See also the consolidated statistics of cancer in the experience of the Charity Hospital of New Orleans, by race and organs and parts, for the period 1908-12, Tables 104 and 105, Appendix F, Part 2.

CHAPTER VIII

THE STATISTICAL DATA OF CANCER FREQUENCY IN FOREIGN COUNTRIES

Comparative Cancer Mortality Rates for Europe—Africa—Asia—Australasia—Western Hemisphere—Limitations of International Statistics—Cancer a World-wide Menace—Effect of Latitude and Longitude, and of Size of Cities—Comparative Death Rates of American and European Cities.

The cancer statistics available for foreign countries are of much the same character and extent as those available for the registration area of the United States. Some of the returns are unquestionably much more trustworthy than others, but their intrinsic worth can be determined only by precise and laborious methods of statistical analysis and medical reconsideration of the original death certificates. Most of the original sources of cancer mortality statistics for foreign states and cities are quite difficult of access to American students of the statistical aspects of the cancer problem, and it has therefore seemed advisable to give special consideration to the statistics of foreign countries and as far as practicable to those of every important geographical subdivision of the world, so as to make the presentation of the facts meet all reasonable requirements. Much available information has necessarily been excluded, since such data would rather have been in the nature of cumulative evidence, not absolutely essential to the present purpose, however useful the facts would have been in connection with strictly local cancer mortality studies.

Comparative Cancer Mortality Rates for Europe

The foreign statistics are given in Appendix G, and contained in 224 tables for the Continent of Europe and 163 tables for non-European countries other than the United States of America. In addition there are given in Appendix E 4 tables which show the cancer mortality according to latitude and size of cities and by organs and parts in thirteen principal countries of the world. Unless specifically so stated all the information from which these tables have been compiled has been derived from official sources, which are, as a rule, indicated in a footnote to each table. A full discussion of this vast amount of statistical evidence regarding cancer frequency throughout the world would obviously be an impossible task in a work of this kind. The main purpose of the present investigation, as elsewhere stated, has been and is to make a reasonably large amount of statistical information regarding the cancer problem available for further study and research. *The assembled evidence of cancer mortality throughout the world reemphasizes the earlier conclusion that the disease is gradually on the increase in practically all civilized countries.* For certain European countries the increase by quinquennial periods during the fifteen years ending with 1910 is briefly shown in the table following:

Comparative Mortality from Cancer in European Countries, 1896-1910

	1896-1900 Rate per 100,000 Population	1901-1905 Rate per 100,000 Population	1906-1910 Rate per 100,000 Population
England and Wales	80.1	86.7	94.0
Scotland	77.1	84.8	99.7
Ireland	58.1	68.5	78.8
Norway	85.7	94.9	96.6
Denmark (cities)	118.9	129.1	137.3
German Empire	70.8	77.7	84.2
Holland	91.9	97.8	103.5
Switzerland	127.4	128.3	125.9
Austria	68.9	74.7	78.3
Hungary	30.7	39.1	43.6
Italy	50.9	55.2	63.6
France (cities)	97.3	92.1	102.7
Combined average	69.1	74.2	81.0

This table brings out the striking fact that for all European countries, with the exception of Switzerland, decidedly higher cancer death rates prevailed during the five years ending with 1910 than during the quinquennial period ending with 1900. For all of the countries combined the cancer death rate has increased from 69.1 per 100,000 of population during the first five years to 74.2 during the second and to 81.0 during the third. The cancer death rate of Switzerland has attained to so extremely high a proportion that a maximum point of frequency has probably been reached.* Of course, in the case of small communities much higher death rates may be and are frequently experienced, and this is also true for certain cities; but for large countries as a whole it would probably be safe to assume a maximum attainable average cancer mortality rate of not less than 130 per 100,000 of population.

For the principal European countries the average cancer death rates for recent years are briefly summarized below:

EUROPE†

	Total Population	Deaths from Cancer	Rate per 100,000 Population
Austria	141,462,903	113,221	80.0
Belgium	36,936,410	24,712	66.9
Channel Islands (Guernsey)	208,900	227	108.7
Denmark (cities)	5,453,322	7,747	142.1
England and Wales	178,980,717	174,602	97.6
France	196,878,000	148,662	75.5
German Empire	318,876,524	277,710	87.1

*The high cancer death rate of Switzerland is not the result of an excess in the proportion of population ages 45 and over. According to the most recent census returns, this proportion was 22.61 per cent. for Switzerland, 22.85 per cent. for Denmark, 21.36 per cent. for England and Wales, and 18.89 per cent. for the United States.

†The data used in this table are, as far as practicable, for the period 1908-12. For information in detail see Table 4, Appendix G.

EUROPE—*Continued*

	Total Population	Deaths from Cancer	Rate per 100,000 Population
tar*	97,823	81	82.8
: (cities)	2,117,670	1,100	51.9
ıd	29,479,395	31,375	106.4
ıry	104,006,496	47,374	45.5
1	21,925,004	17,796	81.2
Man	261,530	339	129.6
	171,995,665	112,087	65.2
	1,056,196	512	48.5
ıy	11,774,100	11,461	97.4
;al	29,060,580	6,504	22.4
ania (cities)	6,410,450	3,940	61.5
ı(Moscow and Petrograd)	8,624,796	7,812	90.6
nd	23,686,521	24,399	103.0
	13,876,836	1,669	12.0
	97,705,000	51,135	52.3
n (cities)	6,685,581	7,022	105.0
rland	18,686,442	23,228	124.3
y (Constantinople)	5,750,000	2,001	34.8
otal	1,431,996,861	1,096,716	76.6
ıtion, 1911	291,384,190		

Limitations of European Cancer Data

average cancer death rate for this group of countries was 76.6 per 0 of population. This rate is based on a mean population of the ies considered of nearly 300,000,000. The rates are not always countries as such, but in some cases only for political subdivisions e cities. Precise information regarding the details of this tabula- ill be found in the notes following Table 4 of Appendix G. In : explanation it requires to be pointed out that the high rate for ırk is partly the result of the fact that the returns are limited to ınd towns, since the data are not made available for the Danish ɔm as a whole. The high rates for the Isle of Man (129.6) and ıannel Islands (108.7) are suggestive.† The extremely low rate

ɔllowing interesting reference to Cancer in Gibraltar is from the Colonial Office Correspondence in ı with the Imperial Cancer Research Scheme (Part I, p. 31): "The organs chiefly affected by cancer in Gibraltar, and in Spaniards residing in the neighborhood, are, in males, the lips and tongue; in ıe uterus and breast. Probably three-fourths of all cases of cancer met with in the practice of the lospital, have their seat in one or the other of these organs. The predisposing causes of cancer, t of the world, appear to me to be, in males, excessive tobacco smoking, leading to irritation of the ngue; in females, premature child-bearing and lactation. The Spaniard's cigarette or cigar is never n his lips if he can help it, and he allows it to burn so close that the actual fire must frequently ɔithelium of his mouth. Again, in females, the generative organs come to maturity at a relatively d, as compared with the general development of the frame, and consequently early sexual relations earing are frequent. This results in undue irritation and injury of the genital tract at a stage when ent tissues are as yet immature, and a condition of cell proliferation is set up which, at some future ıposes to cancer formation."

oportion of population ages 45 and over in the Isle of Man and in the Isle of Guernsey are rather high, means decidedly excessive. For the Isle of Man, according to the census of 1911, the proportion r cent., and for the Isle of Guernsey 24.2 per cent. The corresponding proportion for England was 21.4 per cent.

for Serbia (12.0) is, no doubt, in part at least, the result of defective death registration and poor medical attendance. There are, however, in all probability local conditions which make for a low cancer death rate in Serbia, for as shown by the returns for Roumania the cancer death rate for that country was not much below the average for the European continent as a whole.

Among the numerous special tables of exceptional interest are the returns for Ireland, by duration of illness, for Norway, by geographical districts, for Bavaria, by geographical divisions, for Munich, by religious confession, for France, by the size of cities, for Switzerland, by cantons, according to the predominating German, French or Italian population, for Vienna, with special reference to the Jewish population, for Hungary, by principal races, and for Italy, by provinces. All these tables suggest the practical utility of specialized local statistical cancer studies, which are likely to yield important results.

Comparative Cancer Mortality Rates for Africa

The available cancer statistics for certain political subdivisions of the Continent of Africa are given in the table following:

AFRICA*

	Total Population	Deaths from Cancer	Rate per 100,000 Population
Algeria (Europeans only)	3,688,433	1,257	34.1
Cape Colony (cities)	1,898,895	1,067	56.2
Mauritius	1,843,819	171	9.3
Natal	1,111,756	366	32.9
Sierra Leone (Freetown)	68,218	9	13.2
Transvaal (Johannesburg)	430,745	148	34.4
Total	9,041,866	3,018	33.4
Population, 1911	1,959,645		

The cancer mortality returns for practically all the African countries are of doubtful intrinsic value. Most of the information is of a fragmentary character, due, naturally, to the exceptional governmental conditions and the proportionately large native population. The combined cancer mortality rate for African countries was only 33.4 per 100,000 of population. The exceptionally low rate for Mauritius (9.3) is partly explained by the large East Indian population, and the relatively much higher rate for Algeria (34.1) is due to the fact that the rate is for the European population. There are no cancer statistics for Egypt or even for Cairo and Alexandria that could be utilized in connection with the present investigation.† Among the more interesting data in relation to the African continent are the hospital statistics for Mauritius, the returns for Johannesburg, by race, the hospital statistics

*The data used in this table are, as far as practicable, for the period 1908-12. For information in detail see Table 217, Appendix G.

†The occurrence of cancer in Egypt has been discussed by W. R. Williams in his "Natural History of Cancer," and also in the third volume of the treatise on cancer by J. Wolff (p. 190). According to F. C. Madden, in a treatise on the "Diseases of the Orient," cancer was ascertained to be extremely rare among the Berbers and Sudanese, who are vegetarians, the cases observed being practically limited to the Arabs and the Copts, who have more or less adopted the European mode of life.

for Freetown, which is the capital of Sierra Leone, and the hospital returns for Portuguese Guinea. These returns are merely indicative of sources of information which have thus far been utilized to only a limited extent in the scientific study of the cancer problem. The data collected for the British Colonies through the Imperial Cancer Research Fund have failed to yield the abundant amount of material which an energetic and persistent collective effort on the part of the respective governments and the medical profession could unquestionably bring forth. The local possibilities of specialized cancer research find their best illustration in the discussion of the spread of cancer among the descendants of the liberated Africans or Creoles, by W. Renner, M. D., appended to the annual report of the Medical Department for the Colony of Sierra Leone, for the year ending December 31, 1909. When every reasonable allowance is made for the want of accuracy and completeness in the available returns for the African continent, it would seem safe to assume that cancer is of a relatively very low degree of frequency in African countries, even among the white population of European origin, and that among the native population, as a general rule, malignant disease is extremely rare.

Comparative Cancer Mortality Rates for Asia

The available statistics for the Continent of Asia are briefly summarized in the next table:

ASIA*

	Total Population	Deaths from Cancer	Rate per 100,000 Population
Ceylon	20,076,320	1,133	5.6
Hongkong	1,737,310	140	8.1
India (Calcutta)	4,456,200	522	11.7
Japan	242,460,425	145,965	60.2
Penang	1,391,089	143	10.3
Philippine Islands (Manila)	1,190,154	325	27.3
Shanghai (Europeans only)	68,684	38	55.3
Singapore	1,434,780	181	12.6
Total	272,814,962	148,447	54.4
Population, 1911	57,820,460		

The average cancer death rate for the Continent of Asia, according to this table, is 54.4 per 100,000 of population, as compared with a rate of 33.4 for the Continent of Africa. The rate therefore approaches more closely to the European average of 76.6, and particularly so in the case of Japan, for which country the rate was 60.2.† For certain subdivisions of the Continent of Asia the rates are unusually low, especially for

*The data used in this table are, as far as practicable, for the period 1908-12. For information in detail see Table 232, Appendix G.

†Some exceedingly interesting observations regarding cancer in Japan have been published in the periodical Gann, in German, under the title "Results of Cancer Research in Japan," for the year 1907. Additional information of a trustworthy character is contained in the special analysis of the causes of death among persons insured with the Meiji Life Insurance Company of Japan.

Ceylon,* Hongkong,† Calcutta, Penang and Singapore. For Shanghai, however, the rate for the European population is as high as 55.3, which closely approaches to the average cancer death rate of European countries of about fifteen years ago. That this rate for Shanghai is quite trustworthy is brought out by the fact that the corresponding death rate of Europeans in Manila is 50.6. Among the most interesting returns for the several countries of Asia are those of the city of Calcutta,‡ which extend over nearly forty years, the hospital data, by organs and parts, for Singapore, the special statistics for the European population of the Dutch East Indies, the returns for the foreign-resident population of Shanghai, the returns, by organs and parts, for Japan§ and the corresponding information for the city of Manila.

Comparative Cancer Rates for Australasia

For Australasia the cancer statistics, on account of the relatively much larger European population, are naturally of a more satisfactory character. The indigenous population in most of the countries considered is relatively a negligible factor. The general results are summarized in the following table:

AUSTRALASIA ‖

	Total Population	Deaths from Cancer	Rate per 100,000 Population
Hawaii	962,860	392	40.7
New South Wales	8,142,200	5,948	73.1
New Zealand	4,963,912	3,731	75.2
Northern Territory	6,678	3	44.9
Queensland	2,961,089	1,870	63.2
South Australia	1,996,995	1,525	76.4
Tasmania	950,717	621	65.3
Victoria	6,521,936	5,441	83.4
Western Australia	1,380,353	814	59.0
Total	27,886,740	20,345	73.0
Population, 1911	5,703,425		

*Malignant disease, according to the Colonial Office Correspondence in the furtherance of the Imperial Cancer Research Scheme (Part I, p. 63) is comparatively rare in Ceylon, the average age at death being about forty years. The principal form of the disease is cancer of the buccal cavity, which is attributed to the chewing of betel. This is described as consisting of "tobacco, betel leaves, areca nut, and a little slaked lime to promote the flow of the saliva." It is stated that every native chews betel and eats curry flavored with hot chilies, so that there are invariably two irritants present in the mouth, either of which may determine the occurrence of malignant new growth. Cancer of the breast is rare, though native women suckle their children a long time.

†According to the Colonial Office Correspondence in the furtherance of the Imperial Cancer Research Scheme (Part II, p. 16), the post-mortem records of Hongkong show that out of 15,365 Chinese, only ten were found to have died of malignant disease. The following extract is also from the Correspondence of the Colonial Office in connection with the Imperial Cancer Research Scheme (Part II, p. 17). Cancer among Chinese in Hongkong. "In the case of a disease in which the mean annual death-rate is only 4.45 per 100,000, personal idiosyncrasies are of more moment than the habits of the community, but of these former I have no information. As, however, the habits of the community may throw some light on the fact that the Chinese in Hongkong enjoy a marked immunity from malignant disease, I may say that they smoke but little in comparison with the European, they practically do not chew at all, and their diet consists in the main of rice, with small quantities of fish or pork, and that spices, peppers and hot chilies are not used by them to any appreciable extent. The Chinese 'soy,' or sauce, of which very little is used at a time, is a very mild aromatic liquid, having a slightly vinegary taste. In the case of the Chinese in Hongkong it is principally the alimentary canal and the abdominal viscera that are affected."

‡Of special interest in this connection are the researches of Rogers of Calcutta, including a study of one

The average cancer death rate for Australasia was 73.0, which approaches quite near to the average European rate of 76.6. The rate was highest in the State of Victoria, 83.4, and lowest in Hawaii, 40.7. The cancer death rate of Hawaii, which for present purposes has been included within the geographical limits of Australasia, is naturally affected by the preponderating Asiatic elements. Among the interesting tables for Australasia is a summary return for the Commonwealth of Australia by organs and parts, with distinction of sex, as given in an abbreviated form below:

Mortality from Cancer in the Commonwealth of Australia, by Organs and Parts, according to Sex, 1908-1912
Rate per 100,000 of Population

	MALES	FEMALES
Buccal cavity	11.5	1.2
Stomach and liver	31.8	22.6
Peritoneum, intestines, rectum	8.2	9.0
Breast	..	10.6
Female generative organs	..	15.5
Skin	3.0	1.5
Other organs	19.2	12.2
Total	73.8	72.6

The rates for Australia may be considered as comparable with the corresponding cancer statistics for the United States and Europe. For Fiji the hospital statistics have been included, on account of the special interest which attaches to the returns of cancer occurrence, by organs and parts, according to race. It is regrettable that there should not be more conclusive information available in detail for Hawaii.

Comparative Cancer Mortality Rates for the Western Hemisphere

For the American Continent and other parts of the Western Hemisphere the returns have been summarized in the table following, which represents a registration area with approximately 83,000,000 population. For most of the countries considered the returns are limited to the large cities, and complete returns are not even available for the entire United States. The average rate for the Western Hemisphere, as determined by this tabulation is 65.7, but the range in the rate is quite considerable, and some exceptionally high rates reported for certain localities require further consideration to establish their accuracy. In the summary table the average rate for the registration area of the United States has been included, to facilitate convenient comparison; but the statistical details for this section are given separately in Appendix F, Part 1, following the more extended discussion of the cancer mortality of this country.

thousand autopsy records, the results of which were made public in the *India Medical Gazette*. The evidence tends to show that cancer was comparatively rare among the natives of India.

‡According to K. Sato, as quoted by Coley, of 64,030 patients treated in Japanese hospitals, only 2.14 per cent. suffered from cancer. The proportions in which the various organs were affected were uterus, 33.5 per cent., stomach, 32.0 per cent., intestines, 6.2 per cent., breast, 5.7 per cent., skin, 2.0 per cent., œsophagus, 1.5 per cent.

‖The data used in this table are, as far as practicable, for the period 1908-12. For information in detail see Table 259, Appendix G.

AMERICA*

Western Hemisphere

	Total Population	Deaths from Cancer	Rate per 100,000 Population
Argentina*	17,807,056	11,392	64.0
Bermuda	92,780	52	56.0
Bolivia (La Paz)	316,090	69	21.8
Brazil (cities)	9,384,279	3,145	33.5
British Guiana	1,487,922	271	18.2
British Honduras	197,820	29	14.7
British West Indies*	6,897,104	1,439	20.9
Canada*	19,689,825	12,208	62.0
Chile	17,047,786	6,077	35.6
Colombia (Bogota)	242,986	218	89.7
Costa Rica	1,849,534	751	40.6
Cuba	10,892,077	4,855	44.6
Danish W. Ind. (Is. of St. Thomas)	53,393	63	118.0
Dutch Guiana (Paramaribo)	174,775	167	95.6
Ecuador (Guayaquil)	200,000	122	61.0
Mexico (City of Mexico)	2,355,330	1,165	49.5
Newfoundland	1,192,843	616	51.6
Nicaragua	2,180,000	231	10.6
Peru (Lima)	170,000	202	118.8
Salvador (San Salvador)	357,240	208	58.2
United States (Reg. Area)	271,207,437	202,621	74.7
Uruguay	5,421,854	3,577	66.0
Venezuela	13,331,180	1,960	14.7
Total	382,549,311	251,438	65.7
Population, 1911	82,835,662		

For most of the islands of the West Indies the rates are exceptionally low, a condition readily explained by the preponderating negro population. The relatively high rates for Bermuda (56.0) and the Danish West Indies (118.0) are, no doubt, explained by the high proportion of white population and special hospital facilities made use of by others than residents of the immediate locality. The low rate for Venezuela is probably, in part at least, the result of defective registration and poor medical facilities in the interior. The relatively low rate for Trinidad is partly explained by the high proportion of East Indians in the Trinidad population. There is at present no explanation for the rather excessive rates of cancer frequency returned for the large cities of the United States of Colombia† and Peru. The rates for these countries, being limited to the capital cities, are probably increased by hospital accommodation for operative treatment.

*The data used in this table are, as far as practicable, for the period 1908-12. For information in detail see Table 296, Appendix G.

†A curious error occurs in the statistical survey of cancer throughout the world in the third volume of J. Wolff's treatise on cancer, in which the District of Columbia of the United States is confused with the United States of Colombia, and given accordingly in the discussion of cancer in South America. (Lehre von der Krebskrankheit, Vol. iii, p. 25.)

Among the more interesting tables for the Western Hemisphere are the cancer statistics for Cuba, by organs and parts, according to sex and race, the statistics for the city of Mexico, by organs and parts; and the corresponding returns for the city of San Salvador, limited to a single year, the returns for the city of Lima, Peru, by organs and parts, with distinction of sex, but with rates calculated only for both sexes combined, on account of the want of trustworthy data regarding the sex distribution of the population. The high rate for the city of Trujillo, Peru, is of doubtful accuracy and possibly impaired by the indefinite information regarding the exact population returns. Two tables have been included for the federal district of Rio de Janeiro, showing the percentage distribution of cancer deaths, by organs and parts and according to sex, and there is a similar table for the city of Bahia, Brazil, and the city of Buenos Aires, Argentina. For the city of Santiago, Chile, a table is included of the mortality from cancer, by organs and parts, but without reference to sex. There is a similar table for the Republic of Uruguay, and separately for the city of Montevideo.

Inherent Limitations of International Cancer Data

For many of the countries considered the returns are unquestionably of doubtful value, and strong reasons exist why, perhaps, some of the returns should have been excluded on account of their apparent intrinsic untrustworthiness. Since, however, the primary purpose of this work is to encourage research into the statistical intricacies of the cancer problem, it has seemed advisable to include such data, obtained with great difficulty, as a result of extended correspondence with remote countries, as evidence of the effort to make the present study as useful as possible for future research. The acceptance or the rejection of any particular group of facts must, after all, remain a matter of individual concern, in view of the magnitude of the undertaking and the truly enormous complexity of the problem of accuracy and completeness. In the case of many of the returns for countries and localities throughout the entire world, with widely varying conditions of governmental supervision and control, it would seem a doubtful procedure to reject or exclude data which, after all, may be worthy of serious consideration and therefore useful for the end in view.

Cancer a World-wide Menace

A summary review of the available cancer mortality statistics for the civilized world involves unusual difficulties, on account of the widely varying degree of the inherent trustworthiness of the returns for the different countries considered. That the menace of cancer is world-wide is a far-reaching conclusion which can not be successfully contradicted by conspicuous illustrations of occasional statistical fallacies or by exceptional instances of inaccuracies in the mortality returns. In the main, the statistics for civilized countries are an approximately trustworthy indication of the tendency of the cancer death rate to approach a maximum of perhaps 130 per 100,000 of population. This maximum is far from having been reached in the case of a large number of countries and representative communities, in which, however, the rate is persistently on the increase from year to year. It

has properly been observed that "no statistical judgment deals with the unit but strictly and only with the aggregate." In the case of the present investigation a truly immense amount of statistical information regarding a single disease or a strictly limited group of kindred diseases has been brought together, not for the primary purpose of establishing the causes or conditioning circumstances of the cancer problem, but with the object in view of making the existing statistical data conveniently available for further study and analysis to students of the cancer problem throughout the world. The quality of the data is of course not improved by the mere quantity of the facts collected, but certain inequalities and errors due to small numbers are eliminated, with the result that the general principles deducible from the facts are more precisely established.

Cancer Frequency according to Latitude

The foregoing principles of statistical inquiry may properly be applied to the interesting question as to whether there is a clearly established relationship between cancer frequency and latitude. In the following table the facts have been brought together in a readily comprehended form, on the basis of a city population for 1912 of 69,520,000 and a total number of cancer deaths during the five years ending with 1912 of nearly 300,000. The latitude is given by groups in a convenient form, but unfortunately most of the large cities considered are north of latitude 30 degrees, and the aggregate population for cities south of that latitude is relatively small, compared with the number of inhabitants of cities in northern latitudes. Subject to this limitation, however, the table makes an interesting contribution to the geographical study of the cancer problem.

Mortality from Cancer in Cities according to Latitude
1908-1912

No. of Cities	Degrees of Latitude	Population 1912	Total Population	Deaths from Cancer	Rate per 100,000 Population
35	60 N. —50 N.	23,980,086	112,912,675	119,374	105.7
48	50 N. —40 N.	27,519,705	131,256,257	121,216	92.4
24	40 N. —30 N.	10,195,197	47,944,253	37,451	78.1
7	30 N. —10 N.	2,780,447	13,476,168	5,696	42.3
4	10 N. —10 S.	559,630	2,583,495	1,056	40.9
7	10 S. —30 S.	1,806,951	8,066,144	3,040	37.7
5	30 S. —40 S.	2,678,287	12,297,218	11,048	89.8
130		69,520,303	328,536,210	298,881	91.0

It is shown by this table that the average cancer death rate for 130 of the world's large cities during the period ending with 1912 was 91.0 per 100,000 of population. The rate was highest in the most northern inhabited latitude, or that section of the globe which is comprehended within 50 and 60 degrees north latitude.* The rate for this section was 105.7, diminishing to 92.4 for cities located within 40 and 50

*The arctic and antarctic regions are for the present purposes considered as uninhabited portions of the globe. The cancer death rate of Hammerfest, Norway, the northernmost city of the world (latitude 70° 40′ N.), during 1906-10 was 132.0 per 100,000 of population, and 139.8 during 1911.

legrees to 78.1 for cities between 30 and 40 degrees, to 42.3 for cities between 10 and 30 degrees, to 40.9 for cities between 10 degrees north atitude and 10 degrees south latitude, and, finally, to 37.7 for cities between 10 and 30 degrees south latitude. In the most southerly nhabited belt, between 30 and 40 degrees south latitude, the cancer leath rate again rises to 89.8, which is practically equivalent to the ate for 30 to 50 degrees north latitude. The table, therefore, would eem to warrant the important conclusion that cancer frequency is to a limited extent determined by latitude, which, of course, more or less letermines the climate and weather conditions; in other words, cancer s excessively common in the temperate zone, moderately common in he medium zone and relatively rare in the torrid or semi-torrid zone, which for the present purpose may be construed to include the belt between latitude 30 north and latitude 30 south.*

Cancer Frequency and Longitude

On account of the very irregular distribution of the world's large ities a geographical distribution according to latitude and longitude is of xtremely doubtful intrinsic value. Other factors which determine the ancer death rate are frequently of sufficient local importance to seriously disturb the resulting averages derived in particular cases from a elatively small number of points of observation. In the table following he cancer data for 130 cities are given separately for the eastern and western hemisphere, according to latitude, but the data are not intended o be considered as entirely conclusive.

Mortality from Cancer in Cities, according to Latitude
Eastern and Western Hemispheres, 1908-1912

	EASTERN HEMISPHERE			WESTERN HEMISPHERE		
Degree of Latitude	No. of Cities	Rate per 100,000 Population	Index Number	No. of Cities	Rate per 100,000 Population	Index Number
60 N.–50 N.	35	105.7	98	..	..	..
50 N.–40 N.	22	108.4	100	26	77.3	100
40 N.–30 N.	6	66.9	62	18	85.5	111
30 N.–10 N.	3	13.6	13	4	77.2	100
10 N.–10 S.	1	11.6	11	3	82.7	107
10 S.–30 S.	1	34.4	32	6	38.2	49
30 S.–40 S.	1	90.1	83	4	89.8	116
Total......	69	98.3		61	78.0	

The Index Numbers for the Eastern and Western Hemispheres do not indicate a high degree of correlation, largely because of the fact that

*The following data (original calculations, based on official statistics) are included for convenient reference, regarding the normal climatic conditions prevailing in the 130 cities, arranged according to latitude:

No. of Cities	Degree of Latitude	Mean Annual Temperature	Mean Annual Rainfall
35	60 N.–50 N.	48.0°	29.1 in.
48	50 N.–40 N.	50.3°	34.0 in.
24	40 N.–30 N.	58.5°	37.9 in.
7	30 N.–10 N.	72.5°	57.1 in.
4	10 N.–10 S.	74.6°	83.3 in.
7	10 S.–30 S.	65.9°	40.3 in.
5	30 S.–40 S.	62.7°	36.7 in.

the data for tropical countries are rather insufficient, and that such cities as Calcutta, Hongkong and Singapore are not strictly comparable with cities like New Orleans, Havana and Paramaribo, etc. Moreover, 60 to 40 degrees north latitude in Europe rather correspond with 50 to 40 degrees north in the Western Hemisphere, as regards climatic conditions, but the exact climatological data have not been available in connection with the present study to determine the precise correlation of temperature, rainfall, humidity, etc., to cancer frequency.*

Cancer Frequency according to Size of Cities

It is frequently assumed that the cancer death rate of large cities is excessive chiefly because of the exceptional opportunities for cancer treatment, including facilities for surgical operations. It is held that on this account cancer patients from the surrounding country go to the cities for treatment, often in a far-advanced stage of the disease, with fatal results. Such deaths, under existing unsatisfactory methods of registration are not, as a rule, redistributed according to the residence of the deceased, but are included in the mortality of the city where the death occurred. To a limited extent this conclusion is, no doubt, in conformity with the facts, but its importance is likely to be overrated. In the table following, the cancer death rates of 130 of the world's principal cities have been brought together in three groups, according to size, as to whether the population was 1,000,000 and over or between 250,000 and 1,000,000 or less than 250,000.

Mortality from Cancer in Cities, according to Size
1908-1912

No. of Cities	Size	Population 1912	Aggregate Population	Deaths from Cancer	Rate per 100,000 Population
14	1,000,000 and over	30,872,254	147,889,255	137,531	93.0
67	250,000 -1,000,000	31,907,716	148,806,139	133,286	89.6
49	Less than 250,000	6,740,333	31,840,816	28,064	88.1
130		69,520,303	328,536,210	298,881	91.0

This table, based upon an unusually large number of observations and nearly 300,000 cancer deaths, is of exceptional interest. The table shows that the very large cities had the highest death rate from cancer, or, specifically, 93.0 per 100,000 of population; but this rate was not much in excess of the cities in the next group, for which the rate was 89.6; and the rate in the group following, consisting of relatively small cities, was 88.1, or nearly the same. The table would seem to sustain the conclusion that the effect of the size of cities on the cancer death rate is not of material importance. To facilitate the convenient study of the general results of this inquiry into the geographical aspects of the cancer problem, the data have been consolidated in the form of a series of tables for large cities, with all the essential facts of latitude, population,

*For much valuable statistical information on climate and mortality, with some reference to cancer, see "Mortality of the Western Hemisphere," Panama-Pacific Memorial Publication No. 3, issued in connection with an exhibit on Life Insurance Methods and Results at the Panama-Pacific International Exposition, San Francisco, 1915, by The Prudential Insurance Company of America.

number of cancer deaths and rates per 100,000 of population. The details are given in full in Table 3 of Appendix E. As far as possible, all of the rates used are for the period 1908-12.

Comparative Cancer Death Rates of American and European Cities

In concluding these observations on the geographical incidence of cancer, it has seemed advisable to bring together the comparative cancer death rates of twenty large American cities and ten large European cities, for the period 1881-1912.

Mortality from Cancer, 1881-1912
Twenty American and Ten European Cities Compared

	AMERICAN CITIES		EUROPEAN CITIES		
Period	Cancer Death Rate per 100,000 Population	Index Number	Cancer Death Rate per 100,000 Population	Index Number	Difference in Rates
1881–1885	48.6	100	75.4	100	26.8
1886–1890	50.7	104	82.0	109	31.3
1891–1895	55.0	113	87.9	117	32.9
1896–1900	60.7	125	97.2	129	36.5
1901–1905	69.5	143	106.2	141	36.7
1906–1910	79.3	163	114.4	152	35.1
1911	83.4	172	114.7	152	31.3
1912	85.4	176	118.3	157	32.9

According to this table, the cancer death rate of American cities during the thirty-two years under observation has increased 76 per cent., whereas for European cities the increase was only 57 per cent. The actual increase, however, in the rate for American cities was 36.8 per 100,000 of population, against an increase of 42.9 for European cities. The actual increase in the rate is unquestionably of greater significance than the relative increase, which depends upon the attained degree of cancer frequency at the beginning of the period under consideration. The average cancer death rate for 1912 was 85.4 for American cities, against 118.3 for European cities. The evidence of an actual and relative increase in cancer frequency in American and European cities is clearly established by this analysis, which includes perhaps the largest amount of statistical material regarding a single disease ever taken into account in an investigation of this kind. If the conclusions resting upon the results of this inquiry are not trustworthy, then there is no alternative but to admit that the statistical method has no place in medicine and that the law of large numbers is fallacious in a case where it would seem that it should be most applicable to the facts considered.

CHAPTER IX

SOME GENERAL OBSERVATIONS AND CONCLUSIONS ON THE CANCER PROBLEM

Cancer among Primitive Races—Cancer among the Jews—North American Indians—Gypsies—Determinable Factors of Cancer Frequency—Age and Senility—Physical Condition—Growth and Development—Precancerous Lesions—Gastric Ulcers and Gall-stones—Uterine Cancer—Early Diagnosis—Hospital Statistics—Public Institutions—Soldiers' Homes—Surgical Aspects—Problem of Recurrence—Duration of Disease—Degree of Malignancy—Clinical Signs—Anæmia—Prognosis—Heredity—Overnutrition—Metabolic Disorders—Vegetarianism—Diet—Civilization—Theory of Atra Bilis—Biochemical Aspects—Goitre—Thyroid Carcinoma—Obesity—Alcohol—Smoking—Gall-stones and Chronic Irritation—Tuberculosis—Syphilis—Rheumatism—Gout—Diabetes—Appendicitis—Parasitic Theory—Cancer Houses and Villages—Cancer à Deux or Marital Infection—Surgical Infection—Worry—Insanity—Need of Educational Campaign in Methods of Control—Restatement of Conclusions and Results.

An extended statistical consideration of the cancer problem permits of no other conclusion than that the relative frequency of cancer is decidedly greater at the present time than in former years; that the disease results in an annual loss in the principal civilized countries of the world of not less than 500,000 lives, and in the United States (1915) of approximately 80,000 lives, and that in this country the cancer death rate is increasing at the rate of about 2.5 per cent. per annum. In contrast to a decreasing mortality from preventable causes of death, the mortality from cancer stands foremost as one of the few diseases that are on the increase in the countries for which the official records provide a sufficiently trustworthy basis of conclusive information. In all probability the actual frequency of cancer is somewhat greater than the indicated degree of occurrence as measured by the annual death rate, since a fair proportion of persons suffering from cancer die from other causes, as best illustrated by the occasional instances of the suicide of cancer patients unable to longer endure what has been fitly described as "the agony of a living death." It is also a well-known fact that many surgical operations are successful in prolonging the life of cancer patients, who subsequently die from other causes. The implied menace of cancer is, therefore, more serious than the ascertainable frequency of the disease by means of mortality statistics, but these in the main may be said to reflect with the required degree of approximate accuracy the true liability of civilized mankind to cancer and allied forms of malignant disease. It is, therefore, not an exaggeration to speak of cancer as a *menace* and to emphasize its importance as one of the principal causes of death to which more attention should properly be directed, both as a medical and as a public question, than has heretofore been the case.

Cancer among Primitive Races

The rarity of cancer among native races suggests that the disease is primarily induced or at least increased in relative frequency by the conditions or methods of living which typify our modern civilization.

OBSERVATIONS AND CONCLUSIONS

There are no known reasons why cancer should not occasionally occur among any race or people, even though it be of the lowest degree of savagery or barbarism. Granting the practical difficulties of determining with accuracy the causes of death among non-civilized races, it is nevertheless a safe assumption that the large number of medical missionaries and other trained medical observers, living for years among native races throughout the world, would long ago have provided a more substantial basis of fact regarding the frequency of occurrence of malignant disease among the so-called "uncivilized" races, if cancer were met with among them to anything like the degree common to practically all civilized countries. Quite to the contrary, the negative evidence is convincing that in the opinion of qualified medical observers cancer is exceptionally rare among primitive peoples, including the North American Indians and the Esquimo population of Labrador and Alaska. Evidence is also available to substantiate the conclusion that cancer was relatively of rare occurrence among our negro population during a condition of slavery, but that the frequency rate has rapidly increased during the last thirty years, until at the present time cancer of the uterus is proportionately more common among negro women than among the white women living under much the same conditions of life in the same localities.

Cancer being an affection more or less liable to attack any part of the human body, the variations in relative frequency in this respect are of especial etiological significance. If the causative or contributory factor of cancer of the cheek in Ceylon is the habit of chewing the betel nut, common to native women, it is self-evident that the disease in this form would not be likely to occur among European women not addicted to that custom. Even more convincing is the evidence regarding specific causative or contributory factors in cancer occurrence met with in the case of the natives of Afghanistan, who are peculiarly liable to the so-called *Kangri* cancer, or malignant disease of the external abdomen, caused by burns produced incidental to the wearing of a charcoal-stove, on account of the low temperature common to excessive altitudes. No such cancers are met with in civilized countries, where certainly the diagnosis would be made without difficulty, since these cancers are of the external variety. Similar conclusions apply to chimney-sweeps' cancer in England, and Roentgen-ray carcinoma, limited to X-ray workers. For the same reason, cancer of the breast, the uterus, or the stomach may reasonably be supposed to be rare among one class of people and common among another, without regard to accuracy of diagnosis or completeness of death certification: in other words, the variations in cancer death rates may be primarily explained by decided though possibly not easily ascertainable differences in local conditions, habits, customs, mode of life, etc., and, to a much lesser degree, to possible inaccuracies or deficiencies in diagnosis, etc.

Cancer among the Jews

The statistical data concerning the comparative cancer frequency among the Jews are rather conflicting. More or less contradictory conclusions result from the use of crude statistics which, generally speaking, are not comparable. The term "Jews" for statistical purposes is, as a rule, inclusive of all persons of the Hebrew faith.

The ethnic and social status of the Jewish population throughout the world, however, varies enormously. The extremes of poverty and wealth are probably greater among the Jews than among any other people. It is self-evident that the mortality statistics of Jews typical of the Ghetto type are not strictly comparable with the statistics of the Jewish population of modern cities, like New York, where they enjoy a considerable degree of material well-being. Physically the Hebrews of to-day are European or Aryan rather than Semitic. It has properly been observed that "the Hebrew is a mixed race, like all our immigrant races or peoples, although to a less degree than most." The Jewish people are divided into two chief divisions: first, the northern type, or Ashkenazim, and second, the southern, or Sephardim, also called Spanish Jews. The Jews have mixed or intermarried to a considerable degree with all the races among whom they have settled. The Russian Jew represents, as a class, quite a different physical type from the average American Jew. The mortality statistics of the Jews of Warsaw and Budapest are, therefore, not exactly comparable with the mortality statistics of the Jews of the United States. It is necessary to keep these facts in mind to give due weight to the available data regarding cancer occurrence among the different elements of the Jewish population.

Fishberg in his treatise on the Jews, with reference to pathological characteristics, refers to a curious statement by Lombroso, that the proportion of deaths from cancer was 2 per cent. for the general population, against 3.3 per cent. for Italian Jews. He quotes Braithwaite as having noticed "that cancer of the uterus was seldom or never encountered among the numerous Jewesses attending the outdoor department of the Leeds General Infirmary." According to the same author, a writer in the *British Medical Journal* (March 15, 1902) has stated that in his experience cancer of the breast, was often met with among Jewesses in London. Fishberg himself is responsible for the view that "the mortality from cancer among the Russian Jewish immigrants in New York City is much below that of the non-Jewish population." But on the basis of a study of the reports of a large Jewish and of a large Christian hospital in New York City, he concludes that "cancer is by no means rare among them, although less common than among non-Jews," and he adds that "sarcoma appears to be more frequent among the Jews, while cancer of the breast, and especially of the uterus, is less frequently met with among them."

The subject is reviewed by Wolff at considerable length. The consensus of qualified opinion would seem to favor the conclusion that cancer is proportionately less common among Jews than among Gentiles and that cancer of the uterus is rare. The most instructive data on the subject have been brought together by Theilhaber, who calls especial attention to the rarity of cancer of the uterus among Jewesses, and in contrast thereto the relative frequency of non-malignant fibroid uterine tumors. According to the official statistics of Munich, as quoted by Kirschner, the mortality from cancer of the uterus among Jewesses is much below the average in that city.*

*The cancer statistics for Munich for Christian and Jewish women are given in Table 120, Appendix G.

OBSERVATIONS AND CONCLUSIONS

Auerbach's statistics for Budapest, apparently derived from official ources, show that the general mortality from cancer was about the ame for Jews and Catholics, but the rate for cancer of the uterus was nly 8.6 per 100,000 for Jewesses, against 24.0 for Catholics, and 26.0 or other confessions. In contrast the statistics of Munich appear to rove that cancer of the breast is relatively more common among ewesses than among women of the Christian faith. It is regrettable hat the available data have not been subjected to a thorough critical nalysis. Dr. Felix Theilhaber of Munich, in a contribution to the eriodical on Jewish Demography (March, 1910) restates these conclu- ions, largely on the basis of the statistics of Budapest, to the effect that vhile normally cancer of the uterus accounts for about 35 per cent. f the mortality from cancer among women, and nowhere much less han 25 per cent., the proportion for the Jewesses of Budapest was t most 10 per cent. He adds the interesting observation that this arity may be attributable to the apparently more normal or bundant blood supply of the generative organs among Jewesses, in ontrast to the more or less abnormal and anæmic conditions met vith among Christian women of the temperate zone. He quotes teinhelm to the effect that during a practice of 35 years among the oor of a city with from 25,000 to 30,000 inhabitants, including all lasses, he had never met with a single case of cancer of the uterus mong Jewesses!

Fishberg has advanced the opinion that the same view is held by eading gynecologists of New York City. He makes the additional tatement that "It is well known that carcinoma of the uterus is nore often met with in women who have given birth to children than n sterile women, and Jewesses only rarely remain single." Regard- ess of their higher fecundity the Jewesses are apparently less liable to ancer of the generative organs. He adds, "What the cause is of this eculiarity, whether it is due to some peculiarity of the ritual dietary aws, or anything else, cannot even be conjectured as long as we are gnorant of the cause of cancer," and he therefore concludes that "At ny rate, this seems to be an important field for investigation which nay throw some light on the etiology of cancer."*

It has not been feasible on the present occasion to make an original tatistical study of the comparative frequency of cancer among the ewish and the non-Jewish population. Knopfel of Darmstadt has rought together the data for a period of years, with a due regard to age nd sex, and it is shown that for all ages the comparative mortality from ancer of the Jews *exceeds* the comparative mortality of Christians, but specially so at ages 70 and over. At all ages the cancer death rate of hristian males was 88 per 100,000, compared with 119 for male Jews; nd for Christian females, 116 compared with 177 for Jewesses. These tatistics are representative of the Jewish population of the Grand Duchy f Hesse. In Appendix G, on the Cancer Mortality in Foreign Coun- ries, two tables are included for the Jewish population of Vienna. These ables indicate a high cancer death rate on the basis of the estimated opulation and a high proportionate mortality from cancer on the basis

*Maurice Fishberg, "The Jews," New York, 1911.

of the mortality from all causes, with, however, an apparent tendency during very recent years towards a diminution in frequency (Tables 174 and 175, Appendix G). For Budapest it is shown that the proportionate mortality from cancer was 5.44 per cent. for the non-Jewish population, against 7.01 per cent. for the Jews; but cancer of the uterus occurred in the proportion of 20.2 per cent. of the total mortality from cancer among non-Jews, against only 7.7 per cent. for Jews. The statistics of Holland confirm this experience, for the proportion of cancer deaths in the mortality from all causes in Amsterdam was 5.65 per cent. for Jews, against 15.19 per cent. for non-Jews.*

As elsewhere observed, there are many convincing reasons for believing that cancer frequency is largely conditioned by the attained degree of material well-being, which in a measure is the equivalent of at least a hypothetical tendency to overnutrition. In view of the wide degree of divergence in social and economic status between the Jews of Europe and the Jews of America, it would seem unsafe to accept the available statistical information as entirely conclusive. For a typical Jewish population living in conformity to the ritual there would, however, seem to be no question but that among this class cancer in general is rare and that cancer of the uterus is exceptionally uncommon. Unfortunately, as observed by W. R. Williams, "Although the comparative pathology of the Jew has been fully worked out for most diseases, with regard to malignant tumors the data are scanty and leave much to be desired." But his conclusion would seem to be sound, that "on the whole, however, the available indications point clearly to the conclusion that the liability of Jews to cancer varies with their mode of life, approximating to that of the people among whom they dwell, but generally being somewhat inferior to it." It should be kept in mind that the proportion of persons of the cancer age is relatively larger among Jews than among Gentiles in Europe as well as in America. The exceptional longevity of the Jew is proverbial, but regardless of this fact the proportion of deaths from cancer is generally below the average.

The most recent discussion of the comparative cancer frequency among Jews is found in "The Cancer Problem," by William Seaman Bainbridge. The statistics are derived from the Kosher Wards of the London Hospital for the year 1911. Among males the proportion of cancer cases in the total admissions was 5.1 per cent. for Gentiles, compared with 3.3 per cent. for Jews; among females, however, the proportionate figures were 6.2 per cent. for Gentiles, against 6.4 per cent. for Jews. The earlier conclusion regarding the comparative infrequency of cancer of the uterus is confirmed, in that the proportion of such cancer cases among Gentiles was 8.6 per cent., as against 2.9 per cent. for Jews.

As said before, all statistics at present available are more or less contradictory and inconclusive, but the negative aspect of the evidence is fairly convincing, that cancer is relatively less common among Jews living in conformity to the orthodox principles of their faith, and that

*Mortalité par Cancer à Amsterdam pendant les années 1862-1902, par Feu Le Dr. J. J. Van Konijnenburg, Amsterdam, 1911.

under normal conditions of life they are less liable to the disease, possibly because of their poverty and simple mode of living, especially to cancer of the uterus, than Gentiles of corresponding social and economic status.*

Cancer among the North American Indians

Malignant disease among North American Indians appears to be extremely rare. A special study of the question made by Dr. Isaac Levin in behalf of the George Crocker Special Research Fund, with the approval of the Commissioner of Indian Affairs, brought out the fact that among an Indian population of 115,000 there had been only 29 reported cases of cancer in the entire medical practice of 107 agency physicians, ranging from an experience of a few months to over 20 years. As observed by Dr. Levin in a paper on "Cancer among the North American Indians and Its Bearing upon the Ethnological Distribution of the Disease," contributed to the Studies in Cancer and Allied Subjects of the George Crocker Special Research Fund (New York, 1912), "Cancer is extremely rare among the Indians as compared with the whites of the same locality, since according to the twelfth census cancer is just as frequent among the whites of the states in which the Indian reservations are located as in other states," and thus "the conclusion must be reached that while it may be true that cancer prevails among all the races of mankind, it is also true that the American Indians living under the same geographical and climatic conditions as their white neighbors may be actually nearly immune from the disease."

The infrequency of cancer among the North American Indians can not be attributed to a lower proportion of persons of the cancer age, since according to the approximately accurate data of the thirteenth census the proportion of Indians ages 50 and over was 13.6 per cent., in comparison with 12.3 per cent. for the native white population and 10.4 per cent. for the negro. In the census year 1910 there were 886 deaths from all causes enumerated among Indians living in the registration area, but of this number only 9, or 1.0 per cent., were deaths from cancer and other malignant tumors.

The extreme rarity of cancer among North American Indians is further confirmed by a recent inquiry of my own, made with the approval of the Commissioner of Indian Affairs, inclusive of many different tribes, living in 17 different states. The replies received from agency physicians concern a full-blood population of 52,240 and a mixed-blood population of 10,632. Among some 63,000 Indians of all tribes, living under a variety of social, economic and climatic conditions, there occurred only 2 deaths from cancer as medically observed during the year 1914. The available evidence is therefore quite conclusive that malignant disease is of extremely rare occurrence among the native Indian population of the United States, and the infrequency of the disease suggests the practical importance of further research into the underlying causes or conditioning circumstances of their apparent immunity, as the case may be.

*See in this connection a discussion of the comparative frequency of cancer according to religion and language in Hungary and Budapest, in "Statistik der Krebskranken in den Ländern der Ungarischen Heil. Krone," by Dr. Julius Dollinger, Budapest, 1908.

Of much interest in this connection are the exceptionally valuable "Physiological and Medical Observations among the Indians of Southwestern United States and Northern Mexico," by Ales Hrdlicka (Bulletin No. 34, Bureau of American Ethnology, Washington, 1908). After an extended inquiry Dr. Hrdlicka remarks that "Malignant diseases, if they exist at all—that they do would be difficult to doubt—must be extremely rare. The writer heard of 'tumors' and saw several cases of the fibroid variety, but has never come across a clear case of epithelioma or other cancer; nor has he as yet encountered unequivocal signs of a malignant growth on an Indian bone." That malignant disease occasionally occurs among North American Indians is not to be questioned, but the evidence would seem to be entirely conclusive that cancer is very rare among both the full-bloods and the mixed-bloods of all our Indian tribes.

Cancer among Gypsies

Thus far no effort appears to have been made to determine with even approximate accuracy the relative frequency of malignant disease among Gypsies. The mode of life of this class of people is so exceptional that an inquiry into the occurrence of cancer among them would make a useful and interesting contribution to the cancer cause. It is regrettable that the elaborate and otherwise most valuable Hungarian Gypsy Census of 1892 was not made to include statistics of mortality by cause, with a due regard to age and sex. A fair proportion of Gypsies attain to the cancer age, for out of 243,000 Gypsies enumerated, 15,600 were 60 years of age and over. To a not inconsiderable extent they still live under extremely primitive conditions. Much valuable information concerning their pathology should be obtainable by means of a qualified analysis of the experience data of the General Hospital at Kolozvar, where for many years special attention has been given to post-mortem examinations. It is by means of special investigations of this kind that the most useful contributions to the cancer cause are likely to be made.

Determinable Factors of Cancer Frequency

The statistically determinable factors which apparently materially modify cancer frequency are quite numerous though often obscure and peculiarly involved. In other words, the cancer death rate is more or less modified by the age distribution of the population; the variations in sex proportion; the race; the physique; the condition of health; the occurrence of contributory diseases; the climate; the soil; the character of the water supply; the habits, as regards intoxicating drink, food, nutrition; the physical condition, as indicated by height and weight; occupation; the economic condition, as to well-being or poverty; the mental condition, as regards a predisposition to worry; family history or heredity; and the topographic features of the environment, as brought out in the researches of Green, of Edinburgh. In addition, there is the important question in regard to the possible correlation of cancer frequency in animals and plants, or at least of diseases similar thereto, and last but not least the possibility, though not the probability, of cancer in its final analysis being infectious and therefore a transmissible disease. It would be utterly hopeless as a statistical and

mathematical proposition to establish with accuracy and completeness the precise correlation and relative importance of these numerous but specific elementary factors, all of which apparently have some bearing upon the rate of cancer frequency among the different types of mankind and throughout the different countries and localities of the world.

Problem of Senility

The statement is frequently made that cancer is primarily a function of age; but as elsewhere pointed out, it would be more correct to say that cancer is a function of senility, and even presenility, as made evident by the more common occurrence of sarcoma among the young. In the Industrial mortality experience of The Prudential the proportion of deaths from sarcoma at ages under 30 was 27.9 per cent. of the total mortality from sarcoma, whereas the corresponding proportion for deaths from cancer was only 3.2 per cent. It has properly been observed in this connection by Hastings Gilford, in his treatise on "The Disorders of Post-Natal Growth and Development."

> Just as innocent tumors show themselves to be true errors of growth by terminating at some period of their career, so the malignant tumors indicate that they are errors of development by continuing, like normal developments, while life lasts. . . . The carcinomata and sarcomata are not, like the innocent tumors, mere passive accumulations of piled-up cells, but are aggressive, actively invading other parts of the body from those in which they start. In this way they usurp the nutrition of the body, and by means of toxins or in some mysterious manner sap its vitality, causing the whole organism to become thin and exhausted, finally bringing about its destruction.*

Physical Condition of Cancer Patients

Perhaps the most perplexing aspect of the cancer problem individually considered is the marked contrast of the physical condition of the patient during the onset and at the termination of the disease. The authorities are apparently in entire agreement that cancer is more likely to occur among persons otherwise thoroughly healthy than among those of a delicate or non-robust type. As shown by the results of the Medico-Actuarial Investigation, the cancer mortality rate is distinctly higher among persons of overweight, and the inference would seem justified that at least one of the predisposing factors in cancer frequency is overnutrition rather than malnutrition. Many years ago Dr. John Zachariah Laurence, in the Liston Prize Essay for 1854, on "The Diagnosis of Surgical Cancer," observed that "the previous health of the patient gives us but little information. As a rule, it will be found that cancerous patients have been otherwise remarkably free from disease."† He quotes twenty-one cases in which he had noted the previous health, and in sixteen it had been "unimpeachable," and in the remaining five, "any previous illness the patients may have had had been but of a transitory nature." This view is confirmed by one of the most recent authorities on tumors of the abdominal viscera, who holds as regards constitutional peculiarities that "as far as cases in advanced age are

*There is a rather suggestive discussion of the mortality from cancer in extreme old age in the new edition of the "Reference Handbook of the Medical Sciences," New York, 1913, Vol. ii, p. 596.

†"Mice in poor condition do not offer so favorable a soil for tumor growth as do healthy ones, according to Bashford and Haaland. This may serve to explain the results of those who have described the attainment of resistance by treatment with autolyzed tissues, since the possibility of sepsis in the animals of such experiments has not been eliminated." ("Studies in Cancer and Allied Subjects," by the George Crocker Special Research Fund, Vol. i, pp. 137, 200.)

concerned, they are mostly individuals of very robust constitution who were never sick; had but little if any infectious diseases; had never been troubled with disturbances of digestion, and in most instances came from very healthy, long-lived families. They are in many ways individuals in whose cases one would be tempted to speak of 'excessive well-being,' which, for that matter, may amount to a cause, owing to the fact that such persons are able to expose themselves much more to dietetic indiscriminations without harmful results for a long time." As regards cancer at younger ages, that is, say between 30 and 40 years, the author observes that the reverse is true, and that in this group the patients frequently are individuals inclined to weakness and have a general aspect that is decidedly phthisical, pallor of the face, etc. He further points out that this class of individuals are most likely to become afflicted with lympho-sarcomatous processes.* W. R. Williams, in his "Natural History of Cancer," referring especially to cancer of the uterus, remarks that "the great majority of such persons whose life history he had investigated had been well-fed and well-housed, having had nothing to do but to look after their own domestic establishment. They had usually enjoyed excellent health, most of them having had no serious illness since youth, rheumatic fever and rheumatism being the commonest diseases from which they had suffered." Elsewhere in his work the same author observes that "cancer is a disease of persons whose previous life has been healthy and whose nutritive vigor seems to promise long life. Long-continued observation of cancer patients in the early stage of the disease has convinced me that most of those affected are large, well-nourished persons who appear to be overflowing with vitality.† Such types are indicative of hypernutrition. The small, pale, ill-nourished and overworked women of the type so familiar in Lancashire and other industrial centers, are seldom afflicted with this disease." Some forty years earlier Charles H. Moore, in several contributions to the *British Medical Journal,* gave utterance to much the same conclusions, stating that cancer was chiefly a disease of healthy and strong persons, to which he adds the curious and interesting observation, subsequently neither confirmed nor reinvestigated, that cancer was more common among the first-born. These observations are of profound significance in connection with the objects and aims of a nation-wide effort at cancer control, which, in brief, amounts to no more and no less than the deliberate reduction of the cancer death rate, on the basis of the earliest possible diagnosis and the prompt recourse to approved methods of treatment and cure. It is notoriously the healthy and the strong who are least willing to concede the latent possibility of early death. It is this

*Rudolph Schmidt, "Diagnosis of the Malignant Tumors of the Abdominal Viscera," p. 50. English translation by Joseph Burke, New York, 1913.

†Some very interesting investigations have been made by Miss E. Atlee, regarding the maximum of the lifetime weight curve of uterine cancer patients. The results of her researches are summed up in the statement that body weight attains to its maximum during the years immediately preceding the onset of the disease, and that health and strength remained normal during the same period. In the case of controls (women suffering from other forms of malignant disease) it was found that the body weight had been at its maximum, not during the years immediately preceding the appearance of the disease, but much earlier in life, at which time health and strength, though maximum, had not been necessarily normal. The investigation was apparently not carried through with complete facilities for statistical analysis. The line of inquiry, however, would seem to suggest possibilities of practical value in suggesting a means of an early diagnosis of at least uterine cancer, and eventually perhaps throw new light on the cancer question in general.

class which is most optimistic and least apprehensive when first confronted by faint signs or indications of more or less obscure forms of physiological disturbances. Since cancerous growths are without nerves, pain is absent, as a rule, until the growth has attained to sufficient proportion to press by its weight upon adjacent parts and thus produce a sense of discomfort, which is frequently assumed to be but a passing phenomenon, and, in any event, one which as a rule does not suggest serious future possibilities.

Problem of Growth and Development

Innumerable and varied indeed are the alleged causes or conditioning circumstances of malignant disease. In its final analysis the problem of cancer becomes merged with the problem of life, growth, development and death. In the vast domain of medicine there is no other disease which resembles it in its essential manifestations and obstinate resistance to treatment other than by radical methods. The term *cancer* is used here in the generic sense* merely as a matter of convenience, for even the most painstaking classification fails in rare individual cases, since exceptions to established rules, according to Miller, "are so frequently met with in relation to neoplasms, that the most elaborate system breaks down at many points, unless each tumor be placed in a category by itself." Charles Powell White has directed attention to the analogous cases of mutations and bodily variations which play such an important part in biology.

Precancerous Conditions

Precancerous conditions, as defined by Rodman, may be internal as well as external; and moreover, it is, to say the least, suggestive that "such precancerous conditions are inflammatory, inasmuch as a mild, low-grade chronic inflammation, due to long standing irritation and resulting in either ulceration, hyperplasia, or cicatricial tissue is present in all of them," and "this in turn means diminished arterial supply with lessened physiologic resistance of the cells undergoing metaplasia, and while there may be in addition something more necessary, extrinsic or intrinsic, to initiate the cancer process this much is always present, a suitable soil, if you please, and would seem enough in itself to cause cancer."† Foremost among precancerous conditions, according to Parker Syms, are benign tumors, chronic ulceration, chronic inflammation, and abnormal tissue, such as scars, and prolonged irritation. The experience and researches of Keen and Bloodgood are referred to as tending to prove, with reference to pigmented moles, that these growths are prone to become cancerous, and an enumeration is made of sixty-five cases of malignant moles operated upon, in every case of which the diagnosis was confirmed by microscopic examination. But, by way of contrast, seventy-six other cases of benign pigmented moles are cited, which "were removed in the precancerous stage," and with regard to which it is stated that "there have been no local recurrences and no deaths from internal metastases."‡

*The clinical characters of cancer as a basis for classification is fully discussed in a lecture on "The Biology of Tumors," by C. Mansell Moullin, M. D., in *The Lancet*, March 21, 1914. See also page 166, *et seq.*, on the degree of malignancy, rapidity of growth and clinical signs.

†Annals of Surgery, January, 1914.

‡*Medical Record*, May 17, 1913.

The exact correlation of cancer to other diseases has not been established, but qualified investigations in this direction would unquestionably prove productive of valuable results. The data require to be considered with extreme caution, and in many cases correction will be necessary for variations in sex and age distribution, and possibly other conditioning circumstances. Such investigations should be carried on in connection with the more minute study of the anatomical findings in trustworthy autopsy records, by means of which the primary lesions of cancerous growth may be precisely determined.

Carcinomata, according to Miller, "occur (1) at or near the orifices of the body—lip, tongue, rectum, vagina; (2) at points where normally there is narrowing of a canal—pylorus, ileo-caecal valve; (3) at points where a canal changes its direction—hepatic, splenic, sigmoid flexures of large intestine; (4) in glands such as the mammary, and in organs such as the uterus, which are periodically undergoing hypertrophy and involution. In other words, there is a marked association of cancer with chronic irritation of various kinds."* The term *irritation* is used here in a very general sense. The irritation need not necessarily be mechanical, but may be purely physiological or pathological or even chemical or in the nature of overstimulation of physiological functions incident to metabolism.

Gastric Ulcers and Gall-stones

As of special interest in connection with this brief dicussion of precancerous conditions, a reference may be made to gastric ulcers and gall-stones. In the experience of the Mayo clinic, Rochester, Minnesota, "it has been shown that between 60 and 70 per cent. of cancers of the stomach have developed in the site of a preexisting gastric ulcer,† or in the cicatrix of an ulcer which had been healed," and the conclusion is therefore confirmed by Parker Syms that "we must consider gastric ulcer as a precancerous stage of more than two-thirds of the gastric cancers." Concerning gall-stones as a predisposing condition, the same authority concludes that "in practically 100 per cent. of cases of primary cancer of the gall bladder and bile ducts gall-stones may be found, and it may be demonstrated that they have existed for a long period before a cancer developed." J. Bland-Sutton, in a brief discussion of cancer of the gall-bladder, in his treatise on "Gall-Stones and Diseases of the Bile-Ducts," remarks that "this disease [cancer] has in recent years attracted a large amount of attention; this is in a measure due to its intimate association with gall-stones, though this fact has long been recognised. . . . Careful investigations on this point prove that in at least 95 per cent. of cases gall-stones are present, and this has induced surgeons to regard the presence of biliary concretion in the gall-bladder as a precancerous condition. It is, however, a curious fact, and one worth bearing in mind, that although cancer of the gall-bladder is nearly always complicated with gall-stones, this association is quite exceptional when primary cancer arises in the common bile-duct or the ampulla." The special importance from a statistical point of view of

*James Miller, "Practical Pathology, including Post-Mortem Technique," New York, 1914, p. 297.

†It may be properly stated in this connection that Dr. Wm. L. Rodman is generally credited by the medical profession as having been the first to advise the removal of gastric ulcers on account of the inherent tendency to degenerate into malignant affections.

this observation lies in the fact that there has been a decided increase in the frequency of gall-stone mortality in certain civilized countries, corresponding more or less to the increase in the mortality from cancer.

Prognosis of Precancerous Lesions

Important practical consequences must necessarily result from a general acceptance of the doctrine of precancerous lesions. It, of course, does not necessarily follow that the discovery of such lesions assures in every instance that the process is likely to terminate in a cancerous growth; but the indications are invariably of profound prognostic significance. As observed by Ewing,* "If inoperable advanced cancer is incurable, and localized cancer eradicable, the disease is preventable by dealing with its preliminary stages. Precancerous lesions are not cancers. Practically they differ enormously from the established disease. They can usually be removed by trivial or safe operations, and they are sometimes amenable to less violent treatment." "Gastric ulcers, lingual warts, fissures, and plaques, eroded cervices, pigmented moles, and benign tumors, are everywhere excised," according to this writer, "with the conviction that a malignant tumor may thereby be prevented, but the relation between the benign and the malignant process is still under discussion and often frankly doubted."

Uterine Cancer

The recognition of precancerous conditions would appear to be of especial importance in the case of cancer of the uterus. According to Parker Syms, "there are many conditions which predispose to these cancers, such as simple tumors of the uterus, chronic inflammation of the organ, and chronic ulceration, or so-called erosion, usually the result of neglected laceration and tears." The conclusion would therefore seem justifiable that "All these abnormalities should be remedied because they are precursors of cancer." In the uterus, as stated by Ewing, chronic catarrhal endocervicitis precedes cancer in the great majority of cases, and the cervical erosion is the most definitely established lesion known to precede cervical carcinoma. In the case of the body of the uterus the chief definite etiological factor, according to the same authority, is the association with myoma, which is a tumor composed of mucular tissue, or a tissue of the same nature as the connective tissue of the embryo and of the umbilical cord, and vitreous humor. This tumor is not malignant in itself, but there is apparently a well-established liability of its assuming a cancerous form.

Considerations of this nature are extremely involved pathological and medical problems, which hardly, as yet, permit of being subjected to qualified statistical analysis. The references are included as illustrations of perhaps the most important phase of the cancer problem individually considered; since in proportion as the laity can be made to recognize the value to be attached to precancerous lesions, the outlook for successful medical and surgical treatment must be materially increased.

Difficulties of Early Diagnosis

In this connection the following observations by Dr. Thomas S. Cullen are of especial interest. As regards cancer of the tongue, Dr.

*J. Ewing, M. D., "Precancerous Diseases," *Medical Record*, December 5, 1914.

Cullen points out that the milky patches on the tongue of smokers, if removed at once, would result in no further trouble; but if one waited without interference carcinoma would unquestionably develop. In carcinoma of the lip, if the radical operation were performed, the chances of complete recovery would be considered good. In carcinoma of the stomach, pathology did not as yet aid very much, and if one waited for the stomach-washings to show the characteristic lesions as a prerequisite to a correct diagnosis, it would usually be so late in the course of the disease that little could be done for the patient. It is therefore suggested that an exploratory operation should be made to determine whether cancer was present or not. The surgeon, as well as the pathologist, he points out, was aided in this respect by a fluoroscopic examination, which was destined to play a large role in the making of early diagnoses. If one were dealing with a carcinoma of the intestines, signs of obstruction appeared fairly early, and more and more cases were now apparently cured by early operation. The pathology here was quite characteristic. Cancer of the rectum and lower sigmoid could be detected by the proctoscope, and by its use many early diagnoses were now made. In fact, with the proctoscope a diagnosis was relatively easy in the majority of cases. There are, he concludes, two common types of special importance, cancer of the breast and cancer of the uterus. Cancer of the breast in the early stages might have been beneath the skin and there might not have been any adhesions or puckerings, but as the disease advanced this characteristic puckering of the skin occurred. If one cut into the growth and removed a local area, the portion could be immediately recognized; if it proved to be cancerous, a complete and radical operation should be done, together with the removal of the axillary glands.*

Cancer Hospital Statistics

It is most regrettable that the statistical reports of cancer hospitals should be of such limited practical usefulness. The conclusion applies also to the reports of the larger general hospitals, with the exception of the Johns Hopkins Hospital of Baltimore, which for more than twenty years has published the required statistics in sufficient detail. There is an urgent need of a national movement for uniform methods of tabulation and analysis of statistics, at least of the larger general hospitals and special institutions for the treatment of cancer patients. At present the available data can not be utilized to much practical value in a statistical study of the cancer morbidity and mortality problem, with a due regard to the essentials of age, sex, race and the organs and parts of the body affected. To a limited extent, of course, the existing statistics are useful, if but to emphasize the fact that in the main the results of institutional treatment, at least for certain forms of cancer, are distinctly encouraging. The statistics of the Charity Hospital of New Orleans, for illustration, as given elsewhere in this work show in some detail, the results of treatment by race, but the data, unfortunately, are not given according to sex. In the experience of this notable institution during the period 1910-14, for both races combined, the fatality rate for cancer of the buccal cavity was 14.8 per cent.; for cancer of the stomach and liver, 44.5 per cent.; for cancer

**Medical Record*, New York, April 26, 1913.

of the peritoneum, intestines and rectum, 37.2 per cent.; for cancer of the female generative organs, 15.9 per cent.; for cancer of the breast, 11.3 per cent.; for cancer of the skin, 13.1 per cent.; and for cancer of other organs, 22.8 per cent. For all forms of cancer combined, the fatality rate was 21.1 per cent. For white patients, separately considered, the fatality rate was 21.1 per cent.; for colored patients, 20.9 per cent. The experience includes medical, surgical and gynecological cases. Of the total number of cancer patients, 170 were cases of sarcoma, and 1,349, epithelioma and other carcinomas, including rodent ulcer. The fatality rate among sarcoma cases was 30.6 per cent., and among carcinoma cases, 22.0 per cent.

In the experience of the American Oncologic Hospital of Philadelphia for the period 1909-13, the fatality rate for cancer of the buccal cavity was 13.2 per cent.; for cancer of the stomach and liver, 44.4 per cent.; for cancer of the peritoneum, intestines and rectum, 16.7 per cent.; for cancer of the female generative organs, 27.5 per cent.; for cancer of the breast, 28.6 per cent.; for cancer of the skin, 10.2 per cent.; for cancer of other organs and parts, 25.3 per cent.; and for all forms of cancer combined, 21.7 per cent. Out of a total of 314 cases of malignant disease, 19 were cases of sarcoma and 295 were cases of epithelioma and other forms of carcinoma, including rodent ulcer. The fatality rate for sarcoma cases was 26.3 per cent., and in the remainder of the group of malignant diseases, 21.4 per cent.

The statistics of the Johns Hopkins Hospital have been discussed in some detail in another portion of this work. At the present time these statistics are the most conclusive, differentiating the white and the colored patients according to sex and specific organs and parts of the body affected by malignant disease. For a more extended discussion the analysis and experience data of this hospital for the period 1892-1911, published as a monograph of the new series of Johns Hopkins Hospital Reports No. 4 (Baltimore, 1914), should be consulted.

The statistics of the General Memorial Hospital of New York City are subject to the same inherent limitations as those of the Charity Hospital of New Orleans and the American Oncologic Hospital of Philadelphia. It is also quite apparent that these statistics have reference to *lesions* observed and recorded rather than actual cases and deaths of patients under treatment; in other words, a patient suffering at the time of death from several cancerous lesions would be recorded accordingly, and not only once as is essential for general statistical purposes. Serious errors are certain to result from crude methods of tabulation and analysis.

It is most regrettable that the statistical aspects of the cancer problem should have been so superficially considered in the reports of special institutions for the treatment of cancer patients. In the annual reports of the Barnard Free Skin and Cancer Hospital of St. Louis, with others, no information whatever is given regarding results of treatment, nor are the data given separately according to sex. The same conclusion applies to the annual reports of the Free Cancer Hospital of Brompton, London, which is even more important, since the experience of this notable institution extends over 63 years.

THE MORTALITY FROM CANCER

Practical Value of Uniform Hospital Statistics

In view of the urgent demand for trustworthy cancer morbidity and mortality statistics, it is self-evident that the institutions which fail to provide the required amount of trustworthy and comparable statistical information fail materially in the full discharge of their duty towards their patients, their patrons and the public at large. Such institutions are much more likely to advance their own interests by a full and frank publication of the results than by the present methods of crude and superficial statistical tabulations, which serve no practical purpose, but, much to the contrary, hinder the cause of cancer education and discourage treatment by approved methods under proper institutional conditions.

Subjected to qualified statistical analysis, the experience data of American general hospitals and special cancer institutions should prove of great value in the furtherance of the scientific study of the disease. As a first step towards an urgently required reform, an understanding should be arrived at on the part of the principal institutions to report and publish the facts of their annual experience in a uniform and strictly comparable manner. Such reports would in all probability be less expensive, and certainly much more useful, than the present methods in common use. The annual reports should be amplified by additional statistics of autopsy records, subjected to qualified analysis, so as to establish with greater precision the probable coexistence of cancer and other diseases. Extreme care, of course, is always necessary in the interpretation of the data published for general use.

The statistics of Orth for Berlin, indicating a substantial increase in the percentage of cancer diagnoses made in the case of autopsies, from 4.9 per cent, in 1875, to 7.0 per cent., in 1885, and 14.1 per cent., in 1907, do not, for illustration, warrant the conclusion that cancer in Berlin during this period has increased at such a rate. The data of Lex for Heidelberg are more convincing. Lex shows that the proportion of cancer cases in autopsies increased from 6.6 per cent. during the period 1870-79 to 9.13 per cent. during 1900-07. Reick has reported the results for Munich for a long period, showing a cancer proportion of 7 per cent. in autopsies during 1854-63, compared with 12.5 per cent. during 1894-1903. These percentages, however, have reference only to bodies of persons ages 15 and over. Steinhaus of Brussels compares more recent data of bodies of persons 20 years and over, showing an increase from 8.6 per cent. during 1888-97 to 9.1 per cent. during 1898-1907. Finally, Buday of Kolozvar reports 8.0 per cent. of cancer bodies during 1870-88, compared with 9.9 per cent. during 1889-1905. These statistics are quite conflicting, and it is doubtful whether they can be even approximately considered comparable, in view of the absence of uniform methods of anatomical diagnosis and selection of cases for post-mortem examinations. As observed in the article on cancer in the Reference Handbook of the Medical Sciences, from which the preceding statistics have been derived, the rise in cancer frequency may well be explained by the fact that "cancer patients are much more apt to seek treatment in the hospitals nowadays than a few years ago." But Orth is quoted to the effect that if every allowance is made the autopsy statistics show a moderate increase in the incidence of cancer.*

*"Reference Handbook of the Medical Sciences," New York, 1913, Vol. ii (article on cancer).

OBSERVATIONS AND CONCLUSIONS

n the foregoing observations the main point of view has been the ctical utility of cancer hospital statistics to determine at least ap- ximately the results of institutional treatment. It, of course, is ntial that the facts should be separately stated for the medical and surgical as well as for the gynecological department. This has been ie in the statistics of the Johns Hopkins Hospital, which it has been nd feasible to precisely correlate to the corresponding population by e and according to sex. An equally important purpose, however, is letermine with a close approach to accuracy the distribution of cancer rbidity in sufficient detail, so as to bring out the occurrence of rare ns of the disease, as well as the preponderating mass of the more nmon forms. In all mortality statistics it would be advisable to arate the sarcoma cases from the carcinomata and to give the in- nation by age and sex, as has been done in an admirable manner in the irns of metropolitan hospitals published for the year 1905 in the istical investigations of cancer by the Imperial Cancer Research id. An even more scientific classification was adopted in the sta- ics published in the second annual report of the Harvard Cancer Com- sion differentiating carcinoma and sarcoma as well as special tumors l tumor-like conditions, border-line growths and benign growths.

n detail, there were treated at the Collis P. Huntington Memorial spital during the year ending June 30, 1914, 198 carcinoma cases, 11 oma cases, 19 special tumors and tumor-like conditions, 14 border- growths and 8 benign growths, a total of 250 cases, of which 4.4 cent. were cases of sarcoma. For reasons which can not be dis- sed at length, the experience of every hospital providing special itment for cancer patients is likely to be at variance with the expe- ice of other though similar institutions. The results of treatment, , will probably never permit of exact comparison, in that the quali- tions or conditions on admission naturally must vary widely according he class of patients treated. It is reasonable to suppose that in pub- practice the proportion of advanced cases will be much larger than rivate practice, and the same conclusion applies to white and colored ients, in that it is a safe assumption that the latter would seek treat- it at a later stage of the disease than the former. All of these istical difficulties only tend to reemphasize the earlier conclusion t there is the utmost urgency for the general adoption of uniform hods of tabulation and analysis on the part of at least the more resentative institutions for the treatment of cancer throughout the ted States. If this suggestion is carried into effect, it is certain t the results will prove of substantial advantage in the furtherance ancer research.

Cancer Deaths in Public Institutions

he institutional aspects of the cancer problem are further illustrated ome recent statistics for England and Wales. It is shown that out of 88 deaths of males from cancer, 2,640, or 16.3 per cent., occurred in r Law Institutions; 157, or 1.0 per cent., in lunatic asylums and 5, or 12.4 per cent., in hospitals. Among females, out of 21,135 ths from cancer, 1,928, or 9.1 per cent., occurred in Poor Law In- itions; 216, or 1.0 per cent., in lunatic asylums, and 1,862, or 8.8 per

cent., in hospitals. The proportion of deaths from all causes occurring in hospitals was 8.9 per cent. for males (as compared with 12.4 per cent. for cancer), and 6.9 per cent. for females (as compared with 8.8 per cent. for cancer). The proportion of cancer deaths outside of hospitals was 70.3 per cent. for males and 81.1 per cent. for females. The statistics are of much practical importance, and it should not be difficult to ascertain the corresponding proportion of hospital cancer cases, at least for the larger cities of this country.*

Cancer in Soldiers' Homes

The occurrence of cancer among special classes warrants much more extended statistical consideration than is usually the case. There are many sources of useful information now neglected which in course of time, no doubt, will be made use of to much practical advantage. Among others, a more qualified study should be made of the occurrence of malignant disease among inmates of our national homes for disabled volunteer soldiers. During the period 1906-14 there were 300,343 veteran soldiers cared for, among whom there occurred 2,191 cases of malignant disease, of which 887, or 40.5 per cent., terminated fatally in proportion to the number under observation. The cancer mortality rate was 300 per 100,000 exposed to risk. This apparently very excessive rate is, of course, largely, if not entirely, due to the high average age of the inmates, which is approximately 69 years. The experience illustrates the danger of using crude statistics of cancer morbidity or mortality without a due regard to the age distribution of the population considered. It would be extremely interesting to know the relative frequency of the different forms of cancer among this rather exceptional class of persons, but unfortunately the medical statistics in the annual reports of the Board of Managers of our National Homes for Disabled Volunteer Soldiers do not furnish the required details.

Surgical Aspects

A critical discussion of the medical and surgical aspects of the cancer problem lies outside the scope and plan of this work. The statistical analysis of surgical experience, whether institutional or private, is beset with many difficulties which have their origin in the nature of the case, that the condition of the patients on admission must necessarily vary widely, while at the same time fundamentally conditioning the results of operative treatment and the duration of the future lifetime of surviving cases. A collective investigation would unquestionably produce much interesting information and meet some of the difficulties which arise out of the paucity of the data derived from small institutional or limited private clinical experience. It is remarkable that the statistics of large hospitals, which might yield much useful information, have with few exceptions not been presented in a useful form in the annual reports of even large and influential public institutions. An extended analysis of the data of the Johns Hopkins Hospital, Baltimore, sustains the conclusion that the immediate results of operative treatment are quite favorable in the majority of cases, as shown by the table following, derived from "The Menace of Cancer," in the Transactions of the American Gynecological Society, for 1913.

*Annual Reports of the Registrar-General for England and Wales for 1912 and 1914. See also note to Table 2, Appendix B.

ancer Statistics of Johns Hopkins Hospital, Surgical Department Cases by Sex, 1902-1911

WHITE PATIENTS

	Males			Females		
	Cases	Deaths	Per Cent.	Cases	Deaths	Per Cent.
uccal cavity	130	15	11.5	13	1	7.7
omach and liver	110	26	23.6	56	13	23.2
eritoneum, intestines, rectum	88	19	21.6	35	9	25.7
emale generative organs	..	..	..	3	2	66.7
reast	..	..	..	251	14	5.6
in	40	4	10.0	10	..	..
ther or not specified organs	435	57	13.1	117	7	6.0
All organs	803	121	15.1	485	46	9.5

According to this table the fatality rate was 15.1 per cent. for males and ly 9.5 per cent. for females, but this, of course, is exclusive of the ex- rience with gynecological cases, which are separately given in the ble following:

Cancer Statistics of Johns Hopkins Hospital, Gynecological Department Cases, 1902-1911

WHITE PATIENTS

	Cases	Deaths	Per Cent.
Stomach and liver	8	3	37.5
Peritoneum, intestines, rectum	23	2	8.7
Generative organs	331	35	10.6
Breast	2	..	..
Skin	..	..	..
Other or not specified organs	39	5	12.8
All organs	403	45	11.2

The foregoing tables are restricted to the white patients, since the data r colored patients are rather limited, with the exception of cancer of the nerative organs. The facts are briefly given in the table below:

Cancer Statistics of Johns Hopkins Hospital, Gynecological Department Cases, 1902-1911

COLORED PATIENTS

	Cases	Deaths	Per Cent.
Stomach and liver	1	..	..
Peritoneum, intestines, rectum	6	1	16.7
Generative organs	78	9	11.5
Breast	1	..	..
Skin	..	..	..
Other or not specified organs	16	2	12.5
All organs	102	12	11.8

Postoperative Results

There have been few qualified investigations as regards postoperative results. The published statistics are, as a rule, too limited in the number of cases available and too indefinite as regards the tracing of all of the patients for the required length of time after the date of the operation. A considerable amount of interesting information on this phase of the cancer problem has been brought together by Charles P. Childe, in his treatise on "The Control of a Scourge," published in 1906. As a first step in the direction of systematically observing the results of institutional treatment, the Massachusetts General Hospital has adopted a follow-up system which in course of time should yield results of great practical value. As an illustration of the results obtained by means of qualified surgical treatment, the following observations by Dr. E. S. Judd of Rochester, Minn., based upon his experience in the Mayo clinic, are here included:

Of the 514 patients of whom the subsequent history is known, 266, or 52 per cent., are known to be dead, though 21 of these died from other causes without clinical signs of recurrence of carcinoma, leaving a balance of 48 per cent. of deaths, probably from cancer, for the entire series. Two hundred and forty-eight of the 514 patients were known to be alive from 2 to 11 9/12 years; 37 of these were known to have recurrences. Of the patients operated on during the years 1902 and 1903, 40 have been traced, 27 were known to be dead from various causes, leaving a percentage of 33 alive without recurrence for more than ten years. Three of those who died lived more than 6 years and died from other causes. Of the 321 patients operated on more than 5 years, 266 were traced; 148 were known to be dead and 106 living, a percentage of 40 who had lived more than 5 years. Six of the living had recurrences. Fourteen of these dead had died from other causes than cancer. Of the 510 patients operated on more than three years, 437 had been traced; 234 were dead, 191 living, a percentage of 45 patients living more than 3 years. Twenty-seven of these had recurrences. Nineteen of those dead had died from other causes. One case was reported of a patient who died 9½ years after the primary operation from general carcinosis; one from internal metastases without local recurrence 6 9/12 years after operation; and one on whom a secondary operation for recurrence was done 12 years after the primary operation. In this latter case the patient remained well nearly three years after the secondary operation.*

Problem of Recurrence

The surgical aspects of the cancer problem suggest a brief reference to the related factor of *recurrence*, by which is meant "the reappearance of malignant disease in the locality occupied by the primary tumor, in the immediate neighborhood, in the regional lymph nodes, or in the distant parts of the body, after operative or other interference that has apparently insured the destruction of the disease." As observed in the article on cancer in the Reference Handbook of the Medical Sciences,† "Recurrence in the lymph nodes or in the distant organs must be explained by the assumption that dissemination of the disease has taken place even before the operation. Examples of very late recurrences many years after the operation have forced the assumption of a possible latency of cancer cells; thus, a pigmented cancer of the liver appearing many years after the extirpation of the primary disease affecting one eye is best explained by such a hypothesis. Late local recurrence, on the other hand, may be interpreted as a result of continuation of the same conditions as have led to the appearance of the primary malignant

**Medical Record*, February 21, 1914.

†"Reference Handbook of the Medical Sciences," New York, 1913, Vol. ii, p. 601.

disease." In the article referred to, W. R. Williams is quoted to the effect that sixty-four per cent. of all mammary cancer recurrences take place within the first six months after operation, and about two-thirds of these appear within the first three months. The new cancer centers may be followed by second or even third recurrences after operative removal; occasionally even more numerous recurrences have been observed, though usually the disease is either destroyed by the repeated operations or the patient succumbs to involvement of distant parts of the body.

On the question of recurrence much has been written to small purpose. The statistical determination of the results involves serious practical difficulties, which are quite similar to those met with in investigations of post-discharge results in the sanatoria treatment of tuberculosis.

Duration of Disease

The problem of recurrence is closely allied to the question of disease duration, which particularly in cancer has not been determined with accuracy, even in regard to the period intervening between the appearance of the first serious symptoms demanding medical treatment and the fatal termination of the case. The statistics of the New York State Institute for the Study of Malignant Disease, elsewhere discussed, throw some light on this phase of the cancer problem, but the data require to be used with extreme caution. As observed by Rudolph Schmidt in his treatise on the "Diagnosis of the Malignant Tumors of the Abdominal Viscera," the duration of the disease manifestations from their first appearance to their ending by death naturally varies within wide limits. In only a single instance of his case histories was there a probability of three years' duration, but not infrequently cases were found to extend over two years and several months, so that cases running over a period of two years could not be considered rare, and the facts available would seem to prove that a correct diagnosis could have been made at the beginning of the disease. Dr. Otto of Copenhagen, at the second International Conference on Cancer, held in Paris in 1910, gave an interesting account of the duration of malignant disease of the digestive tract, demonstrating the shortness of the period between the first symptoms and death in 196 cases, and concluding that "the first symptoms appeared and the clinical diagnoses were made subsequent to a long latent period, of which the duration depended upon anatomical and other factors."*

The Pennsylvania Cancer Commission, in an investigation of 400 cases, according to Dr. John A. Hartwell, found that

> Superficial cancer had been apparent on an average of eighteen months before the case came to the surgeon, and eleven months had elapsed between the time that a surgeon had been consulted and the date of the operation. In deep cancers this time was one year. About one case in thirty of breast cancer was not even examined by the first physician consulted, and in one case in six, salves, ointments, etc., were prescribed, with advice to temporize. Sixty-eight per cent. only of superficial cancers were operable when they came to the surgeon. Only 48 per cent. of deep-seated cancers were operable when first seen by the surgeon. In a series of cases covering five years in a representative hospital over 63 per cent. of the cancer cases were found totally inoperable.†

**British Medical Journal*, October 22, 1910.

†*Medical Record*, New York, April 26, 1913. See also report to Medical Society of Pennsylvania by its Commission on Cancer, by J. M. Wainwright, Chairman, Harrisburg, Pa.

In this connection the following table, derived from the special report on cancer in Ireland, showing the duration of previous illness according to sex, for all cancers, and separately for cancer of the stomach, uterus and breast, is included as an interesting illustration of the utility of even crude statistical methods in rendering aid to the cause of cancer research.

Mortality from Cancer in Ireland, by Organs and Parts, and Duration of Illness, according to Sex, 1901

	Males		Females			
Duration of Illness	All Organs (Per Cent.)	Stomach (Per Cent.)	All Organs (Per Cent.)	Stomach (Per Cent.)	Uterus (Per Cent.)	Breast (Per Cent.)
Under 6 months......	34.0	41.6	30.7	39.0	20.3	11.2
6 months–1 year......	37.0	36.7	35.5	34.6	46.5	32.5
1–2 years............	21.1	19.6	24.1	21.3	26.2	37.7
2–3 years............	4.2	1.2	5.5	3.5	3.8	10.8
Over 3 years.........	3.7	0.9	4.2	1.6	3.2	7.8
Total with known duration...........	100.0	100.0	100.0	100.0	100.0	100.0

(For details see Tables 47 and 48 of Appendix G.)

It is brought out by this interesting analysis that the proportion of cancer deaths with a previous disease history of over 3 years was 3.7 per cent. for males, and 4.2 per cent. for females, of the cases with a known duration. For cancer of the stomach the corresponding proportion was 0.9 per cent. for males, and 1.6 per cent. for females; for cancer of the uterus, 3.2 per cent.; and for cancer of the breast, 7.8 per cent. In the majority of cases of known duration the disease had been in existence or had been observed by the patient for at least six months or over.* For cases of known duration the proportion of cancer deaths with a previous history of over 1 to 2 years was 21.1 per cent. for males, and 24.1 per cent. for females. Accepting the principle laid down by the American Society for the Control of Cancer, that "in the early recognition and treatment of the disease lies the hope of a cure," it is self-evident that a fatal termination could in many cases be prevented by the avoidance of needless and hopeless delay.†

Degree of Malignancy

The previous duration of cancerous disease is primarily conditioned by the type of the cancerous growth, which is subject to a varying degree of malignancy, in turn affected by the powers of disease resistance, which are also subject to wide variations. There are, for illustration, the slow growing tumors, arising from fibroblasts, called fibromata, and the rapidly growing fibrosarcomata, which, according to F. B. Mallory, "represent extremes in the rate of growth." The duration of the disease

*Some interesting facts are disclosed by the analysis of the Ordinary Experience of The Prudential Insurance Company of America for the period 1886-1912 (1401 male deaths, and 641 female deaths). For males the average previous duration of insurance was 6.8 years for cancer of the stomach and liver, 6.5 years for cancer of the peritoneum, intestines and rectum, 6.3 years for cancer of other organs or parts, 5.7 years for cancer of the skin, and 5.6 years for cancer of the buccal cavity. For females the average previous duration of insurance for cancer of the stomach and liver was 6.3 years, for cancer of the breast, 6.3 years; for cancer of other organs or parts, 5.7 years; for cancer of the skin, 5.6 years; for cancer of the peritoneum, intestines and rectum, 5.4 years; and for cancer of the generative organs, 5.2 years.

†Some additional data on the subject of duration of cancer previous to death are given on page 115.

requires, therefore, to be determined with reference to biological considerations, and especially is this true in regard to the primary division of cancers into sarcomata and carcinomata. The former, which are much more common in early life, usually run a much more rapid course, whereas in some of the latter, particularly in very advanced ages, the duration of the disease may extend over a number of years. The statistical aspects of this phase of the cancer problem have as yet received very inadequate consideration. It has been observed in this connection by Dr. C. Mansell Moullin, that

> Cancer is not a definite entity nor is sarcoma. The cancer of one organ differs from the cancer of every other organ, and the cancer of each individual person is as different from the cancer of all other individuals as his constitution is from theirs. . . . Sarcoma and carcinoma are artificial groups, not natural ones. It is not possible to define or limit either of them.* . . . The cancer of one organ is entirely different from the cancer of every other organ, and the clinical history of periosteal sarcoma varies with the bone to which the periosteum belongs. Each organ and each tissue has its own variety of malignant tumor, just as it has its own variety of innocent tumor, though the microscope may be unable to distinguish them, and the innocent tumors of each organ shade off by imperceptible stages into the malignant ones, so that together they form one group. No line can be drawn between them.†

These observations reemphasize the earlier conclusions regarding the difficulties of a generally satisfactory tumor classification. If the point of view advanced by Dr. Moullin is sound, that "clinical characteristics are of no value for the classification of pathological growths such as tumors," and "whether a tumor is what we call malignant or not depends upon the degree of maturity already reached by the cell from which the tumor bud first branched off upon its independent career," there remains probably no other course in statistical procedure than to continue the present practice of an anatomical classification, which simply by reference to the organ or part of the body affected by malignant disease indicates with a high degree of accuracy the immediately important contributory circumstance or condition responsible for the primary cancerous growth.

The involved nature of the tumor problem presents so many interesting and important special problems that it would be utterly hopeless to meet the requirements of biological or pathological science by even the most refined methods of statistical analysis. For illustration, tumors have various shapes, or according to the division adopted by Delafield and Prudden, they may be nodular, tuberous, fungoid, polypoid, papillary, dendritic, lobulated, etc. They may occur singly or in greater or less numbers in the same or in different parts of the body. The degree of malignancy could probably never be successfully presented by means of statistical data, even though derived from a large institutional experience. According to Delafield and Prudden, "The more obvious marks of malignancy in a tumor are: 1. Invasion of

*The Lancet, March 21, 1914.

† RELATIVE INCIDENCE OF CARCINOMA AND SARCOMA

	Total Deaths from Cancer	Deaths from Sarcoma	Per Cent.
England and Wales (1908-1912)	174,602	10,250	5.87
Scotland (1907-1911)	23,755	1,245	5.24
Ireland (1908-1912)	17,796	812	4.56
Norway (1908-1912)	11,461	580	5.06
Switzerland (1906-1910)	22,963	1,368	5.96

adjacent tissues by eccentric or peripheral growth. 2. The tendency to local recurrence after removal. 3. The formation of metastases. 4. An interference with the nutrition and general well-being of the body, which may give rise to a condition known as cachexia." Here also the methods of statistical analysis must prove inadequate to the needs of the medical and surgical profession.

Rapidity of Growth

However involved these biological and pathological considerations of the cancer problem may be to the statistician, they can not be entirely ignored; in fact, to a large extent the correct interpretation of statistical data depends upon a thorough understanding of the underlying elements of the problem, which, if left out of consideration, may seriously, if not completely, invalidate the conclusions reached. In regard to the average duration of cancerous disease and the relative rapidity of growth of tumor tissue, it may not be inappropriate to include here the following interesting observation by Ritchie:

> Rapidity of Growth.—This varies very much in different cases. Sometimes, as in the case of many malignant connective-tissue tumors—e. g., those occurring in bone—the growth is extremely rapid, and in the course of a few months, or it may be weeks, the tumor may attain to such a size as to constitute a very definite proportion of the total body weight. In such a case, direct microscopic evidence of vegetative activity may be found in the abundance of mitotic figures observable in the cells. In other cases of malignant-tumor formation the growth is much more slow, this being exemplified in certain epithelial tumors, say of the lip, and especially in some of the tumors liable to develop in connection with the intestinal mucous membrane. Here there may be evidence of tumor formation being present for many months, in certain cases years, before any gross tumor results. Generally speaking, the connective-tissue tumors are those of most rapid growth, and the epithelial and hypoblastic tumors are the slowest.

To the foregoing is added the following extremely interesting observations by Hastings Gilford, from his treatise on "The Disorders of Post-Natal Growth and Development":

> Cancer varies greatly in its rate of extension. It may be so rapid as to simulate inflammation. Indeed, quickly growing sarcomata accompanied by redness and pain have often been opened in mistake for abscesses. On the other hand, cancers are sometimes so slow in their progress that they make very little headway, even after they have been in existence for years, and are prone to be mistaken for fibromata. Their rate of growth is largely influenced by the surroundings. If adjacent cells be also more or less on the verge of degeneration, as in old age, the progress is, as a rule, very slow. If, on the other hand, the neighboring cells are engaged in the activity associated with progressive development, then the progress of the cancer is, as a rule, greatly accelerated. The difference seems to depend upon the suitability of the environment. When the surroundings are congenial the progress is slow; when they are uncongenial the progress is rapid. It is, perhaps, never more rapid than when the cancer attacks the lactating breast, and never slower than when it forms in the useless senile breast, as the "stone cancer" of old women. All forms of cancer are more prone to appear in those organs which naturally undergo rapid changes, like the breast, and the glands in the cervix of the uterus, than in those which are comparatively stable in their development, like bone, cartilage, and muscle. Cancers show at times the peculiar feature of being temporarily delayed or stopped in their progress, and these phases of arrest or of increase may alternate more than once before the disease finally puts an end to existence.

These observations are of much practical importance in connection with well-directed efforts to arouse public interest in the menace of cancer and the possibilities of cancer control.

The problem of fundamental causation must for the time being be considered secondary in importance to the question of conditioning or

contributory circumstances favorable to the occurrence and development of malignant dis[illegible]: for if even so simple a fact can be brought home to the laity that [illegible]s a material difference in the rate of malignant growth—whether sarcomata or carcinomata, whether among the young or among the old, whether among the strong and robust or among the anæmic and weak—much will have been gained in the direction of increasing the number of cases presenting themselves for early and qualified operative or other treatment. The public must understand that there are degrees of malignancy and that there is an increased probability of recurrence in the case of delayed operation. As a rule, "the less differentiated the type of cell composing the tumor the more malignant it is," and "the small round-celled sarcoma is one of the most malignant types." Since the sarcomata are much more common to children and young persons, it is self-evident that the earliest possible qualified treatment is imperatively called for in such cases where the preliminary diagnosis warrants even the suspicion of a possibly malignant growth. "Experience," according to Montgomery, "has taught us to give a very unfavorable prognosis when cancer of the uterus appears prior to the age of 40. Possibly the hopeless outlook is in part due to the greater activity of the lymphatic system, the vessels of which decrease in size and number with the advent of climacteric."*

The age of the patient in cancer cases is always an element of importance in estimating the probabilities of successful treatment. Lockwood in his treatise on "Cancer of the Breast," concludes that "a breast tumor in a *young* woman is more likely to be innocent than malignant." The average age of 43 women operated upon for innocent tumors was only 36.6 years, whereas the average age of 47 persons operated upon for carcinoma of the breast was 53.68 years.

Clinical Signs

There are apparently no absolutely conclusive clinical signs which can be relied upon for the correct diagnosis of tumors; but malignant disease, at least when fairly well advanced, is, as a rule, a cause of emaciation. Under the title of "General Debility, Pallor, Emaciation," Savill enumerates the symptoms of malignant disease to consist of (1) a loss of weight, which occurs quite early in the disease, sometimes long before any local signs can be detected. This is accompanied by a typical cachexia—i. e., an appearance of illness in which the skin assumes an ashy or sallow hue. (2) The age of the patient is generally advanced in carcinoma, young in sarcoma, and the four classical signs of the disease are pain, swelling, offensive discharge and hæmorrhage. (3) Pain at the seat of growth is often complained of, especially in rapidly growing varieties, or when they occur in tense parts. (4) In accessible situations a thickening, swelling, or tumor may be detected, which is usually hard, nodular, and apt to fix and infiltrate the surrounding parts. Some sarcomata, however, are soft and pulsating. (5) Whenever the growth involves a mucous or epidermal surface there is an offensive pink or sero-sanguineous discharge. (6) In like manner hæmorrhage may occur, and take the form either of metrorrhagia, coffee-ground vomiting,

***Journal of the American Medical Association*, September 21, 1907.

or melæna; and when the disease involves the pleura or peritoneum the effused fluid will be blood-stained. (7) In carcinoma the neighboring lymphatic glands become enlarged and palpable. (8) The rate of growth is rapid, though it varies widely in different forms and localities. Scirrhous infiltration of orifices may only reach the thickness of half an inch in six to twelve months, and the patient may live two years; but a round-celled sarcoma may reach the size of a hen's egg in a month or two and kill in six.*

Anæmia and Emaciation

To much the same effect is the enumeration of symptoms by Williamson in the fourth edition of French's "Practice of Medicine." With special reference to cancer of the stomach, it is held that

There is great diversity in the symptoms of different cases. There may be no manifestaions by which the disease can be recognized until comparatively late. The history of it that is generally obtained is *indigestion during several months*, increasing in severity, and attended with *anemia* and *emaciation*. . . . The early symptoms in an ordinary case are loss of appetite, impaired digestion, pain, nausea, and vomiting.† These usually develop so insidiously as to conceal the time of actual onset; rarely, however, they appear abruptly after an attack of influenza, or an acute indigestion. . . . *Pain* is a prominent symptom in about three-fourths of the cases and often occurs early. It is usually confined to the epigastrium, but may be referred to the shoulders, sides or back. It is generally of a burning, gnawing, or dragging character; distinct cardialgia rarely occurs. It is generally constant, but increased by ingestion of food. . . . *Anemia* and *cachexia* are often early symptoms and almost invariably present. The number of red corpuscles often sinks below 3,000,000, occasionally below 2,000,000, and the hemoglobin may fall below 50 per cent. . . . When the anemia is extreme there is often edema of the lower extremities and sometimes a more general dropsy. *Emaciation* often begins early, but in a large proportion of cases there is little loss of weight until a late period of the disease. The degree of emaciation is often remarkable, the body being literally reduced to "skin and bones." The decline of strength usually keeps pace with the loss of flesh, but a surprising degree of vigor is sometimes retained to the end.‡

These extended references to the diagnosis of cancer are included primarily for the purpose of emphasizing the difficulties of the statistical treatment of the more complex aspects of the cancer problem. They also have reference to the question of accuracy and completeness in death certification; but it is necessary to keep in mind that the initial diagnosis is naturally much more difficult than the terminal diagnosis, when, at least to the trained physician, the manifestations of the disease are readily apparent.

Prognosis of Cancer

The prognosis of cancer, particularly in cases where the treatment has been delayed, is, according to Savill, "always of the gravest kind, the course rarely lasting more than one, or at the outside, two years. . . . The prognosis largely depends upon the stage at which the true nature of the case is detected. On this depends very largely both the

*Savill, "System of Clinical Medicine," New York, 1912, 3d edit., p. 588.

†"Cancers vary much. Some, for instance those of the skin or lip, cause no anæmia, while a fulminating cancer, as of the stomach, may give a perfect picture of preliminary pernicious anæmia, or, indeed, of leukæmia. In general it is stated that the more malignant the tumor the greater the blood changes, and the more extensive the cancer, that is, the more its metastases, the greater its influence upon the blood. But this is not entirely true: our cases with rapidly developing metastases, with large nodules, are those with a slight chlorotic anæmia; those which simulate pernicious anæmia are more often cases with few if any objective signs of cancer, and at autopsy one finds an insignificant looking little nodule." (Emerson's "Clinical Diagnosis," p. 636.)

‡French, "Practice of Medicine," 4th edit., pp. 773-776.

prospect of arrest and of removal. In general terms the prognosis also depends on (1) the position and accessibility of the growth, how far vital structures are involved, and whether it is on or near the surface; (2) the structure of the tumor; and (3) the age of the patient, to some extent, for growth is more rapid in the young."*

These observations have an important bearing upon the problem of cancer control. At the present time the percentage of cases successfully treated is relatively small, as made evident by the considerable annual mortality from malignant disease throughout the civilized world. The available evidence is entirely conclusive that by early diagnosis and prompt, radical treatment, a fair proportion of the lives now lost could be saved or prolonged for many years. As pointed out by Bloodgood, "The clinical symptoms of cancer of the uterus are so distinct that it should not be difficult to educate patients and the profession, but unfortunately, even at present, the percentage of patients with cancer of the uterus seeking expert surgical advice in the inoperable group is still large," and he points out further in this connection that "if it has been difficult to educate people and the profession as to the potential danger of a lump in the breast, small and painless defects of the skin and mucous membranes and irregular bleeding from the uterus, it will be much more difficult to educate them to the significance of abdominal pain, indigestion and changes in the stools." He therefore concludes that the control of cancer is a problem of education, and that those clinics which have the records, the pathological proofs, must work up their statistics so that we may increase our evidence in support of the statement that cancer has been cured.†

Heredity

Such a process of education will not be an easy matter. There are deep-rooted convictions which will have to be overcome by the accumulation of indisputable evidence, which must be largely obtained by means of qualified statistical research. There is still a wide-spread belief that cancer is a blood disease, frequently inherited, possibly contracted by infection, and in any event, extremely difficult to cure or control by medical or surgical means. The apprehensions of members of families in which one or more cases of cancer have occurred are in obvious contradiction to the available evidence that cancer is not inherited in the strict sense of the term, and that the probability of an inheritance of a predisposition to cancer is relatively remote and decidedly less than in tuberculosis. The evidence brought together on this point in the chapter on the relation of the cancer problem to life insurance fully sustains the conclusion that the available facts are largely of a negative kind. The conclusion advanced by Rudolph Schmidt, that "many an ancestral tree that has been studied, scarcely leaves room for doubting the possibility of direct transmission," is not sustained by the required statistical evidence, in other words, by a sufficient number of authentic cases, to remove the margin of reasonable doubt as regards the occurrence of mere coincidence or the influence of collateral factors, such as an inherited

*Savill, "System of Clinical Medicine," New York, 1912, 3d edit., p. 589.

†*Journal of the American Medical Association*, December 27, 1913.

exceptional longevity on the part of the parents and their offspring from a long line of long-lived ancestors, or the continuity of almost identical habits and modes of life more or less in the nature of predisposing causes. Thus, for illustration, it is possible that the drinking-water of a community may act as a chemical irritant and as such have a strong influence upon the body fluids, as is apparently the case in endemic goitre.

Family History

The number of separate and distinct factors which condition the relative frequency of cancer among the different types of mankind entirely preclude the possibility of any one of them being of predominating importance. The researches of Karl Pearson, including the family history of some 3,000 cancerous persons and a comparative study of the same number of non-cancerous patients, appear to establish the conclusion that "there was practically no difference between them in respect to the prevalence of the disease among their relatives." This conclusion is further sustained by the collective experience of American life insurance companies and the less extensive experience of The Prudential. Bashford, in a well-written argument on "Heredity and Disease" presented to the Royal Society of Medicine, remarks that "Taking the surface of the body as an example, the incidence of cancer in different races of mankind is characterized, on the whole, not so much by innate racial peculiarities as determined by extrinsic irritants. Why some individuals escape the consequence of peculiar practices involving chronic irritation, and others do not, it is at present impossible to decide. Disregarding all other hypotheses, we fall back on an undefined susceptibility of the body, which we conceive as being more exaggerated in some persons than in others. There is certainly no evidence for the inheritance of cancer as such—only the possibility of a predisposition can be discussed." Bashford refers to an interesting paper by W. Harrison Cripps on "The Relative Frequency with Which Cancer is Found in the Direct Offspring of a Cancerous or Non-cancerous Parent," using in addition the data presented by Dr. Ogle in the Fifty-second Annual Report of the Registrar-General of England and Wales. He provides the required statistical evidence that "When no hereditary influence is assumed, the frequency of cancer as a cause of death is so great that few families of large size escape; and in one of every two families either a parent or a grandparent will, on an average, have died of cancer, supposing such parents and grandparents to have died after 35 years of age," or in other words, "The mortality from cancer is so great that, on an average, in one of two families either a parent or a grandparent will have died of cancer without assuming hereditary predisposition. Hence the use made of such records to prove the occurrence of a large number of cases of cancer in a selected number of families is not warranted."

There are few more interesting directions in which qualified statistical research could aid the scientific study of the cancer problem than by an extended analysis of authentic family records over a long period of years. Unfortunately such records are extremely difficult to secure, and it is practically impossible to give due weight to all the other factors

and conditions likely to determine the rare or excessive incidence of cancer met with in exceptional families for which the data concerning cancer may be available.*

Cancer Heredity in Mice

The experiments on animals which have been made under the direction of cancer research funds seem to establish that a predisposition to cancer can be developed under given conditions; but it is not at all likely that the artificial laboratory conditions are ever experienced in actual life, in which the factor of variation is enormous. Prof. Tyzzer, of Harvard, has investigated the life history of a family of mice consisting of 100 individuals, of which a post-mortem examination was made immediately after death. Even this number of cases, in the opinion of the author, was too small for final conclusions, but as observed by Murray in an editorial in the *British Medical Journal*, "The figures are certainly striking, and it is not improbable that the modern view that heredity has but little influence in regard to susceptibility to cancer may require to be modified as a result of experimental research." Miss Maud Slye of the Sprague Memorial Institute of Chicago has made two reports upon the incidence and inheritability of spontaneous tumors in mice, including observations on 390 cases. The conclusions of Miss Slye are summed up in the brief statement that "Cancer is probably possible in any mouse, but it is likely to occur where heredity predetermines," or in other words, "Heredity determines in which cases it shall develop into a malignant cancer." In another paper by the same author the statement is made that "Hereditary influences show a marked relation to the occurrence and character of lung tumors. Of 155 cases investigated from this standpoint there was a tumor ancestry in 146, and in but 9 of the cases lung tumor appeared in the mice without tumor ancestry."

It must be seriously questioned whether these conclusions are practically applicable to the consideration of cancer as a human problem. The conditions under which human beings grow and develop, persist and survive, are fundamentally different from those which affect animal life. The factors of deliberate control and the enormous power of adaptability to changing environmental conditions utterly preclude the possibility of the unrestrained effect of possible hereditary tendencies towards particular diseases, especially cancer, which, as a rule, occurs very late in life, when the degree of bodily resistance, on the one hand, and the effect of special habits of life, on the other, have become well established and assumed a power equivalent to direction and control. The same analogy, which would reduce the human body to the mechanism of a machine, breaks down in the case of cancer theories which would make the human organism conform in its conscious or subconscious development to the elementary and non-intelligible mode of animal life. In other words, granting the possibility of direct inheritance of a

*"Given a sufficient number of families, it is a certainty, even if there be no such thing as heredity, that of at least one family, say ten members will die of cancer. The only absolute proof of heredity would be to show that cancer occurred frequently in certain families, and practically nowhere else; short of this the probability of heredity of cancer would be increased if it could be shown that cancer was much more common in certain families than in the average for the whole community, due allowance being made for variations in age and sex-distribution." (Newsholme's "Elements of Vital Statistics," p. 201, quoted in the George Crocker Special Research Fund Publication, Vol. i).

predisposition to cancer, the numerous external factors of every-day life, of years of self-directed effort, of changes in habits, climate, food, etc., all preclude, excepting possibly in the rarest cases, a predetermined occurrence of cancer in the offspring of a cancerous parent under the normal conditions of human existence. The discussion on the subject of heredity in cancer, with special reference to the laboratory evidence of such a transmission in the case of mice, is summed up by the *Journal of the American Medical Association* in the statement that "the *liability* is the thing transmitted, but without appropriate conditions the effect is not produced; that is, heredity modifies the character or degree of the effect produced by a common injury," which leaves us much in the same position as before. The appropriate conditions do not repeat themselves in the normal human life; but if cancer is the result of local irritants, then any and all factors which contribute towards this end must have their influence, although a single factor under given conditions, as in *Kangri* cancer or X-ray dermatitis, may be so self-evident as to preclude the possibility of collateral or contributory causes or conditions. In any event, the available evidence, statistical or otherwise, does not sustain the conclusion that the factor of human heredity is of much material importance, individually or collectively considered.

Cancer and Overnutrition

The evidence is decidedly more conclusive that there is a direct relation between malnutrition or overnutrition and cancer frequency. The relation of diet to cancer has been discussed in some detail by Dr. L. D. Bulkley of New York, who, after referring to the question as to whether there is not some deeper fundamental cause lying back of the trouble which should be reached and rectified by medical skill and acumen, observes that "It is recognized by all that the tissues develop and are maintained by nutrition derived from the food and drink taken, and tumors all certainly grow by the same means. For years it has been claimed by one person or another that diet has more or less influence in the production of cancer, and even over one hundred years ago, Howard Lambe and others produced strong proof to show the effect of diet in curing certain undoubted cases of cancer of the uterus, the diagnosis of which was confirmed by prominent surgeons of the day." Even earlier than this Johann Philip Berchelmann, in a treatise published in Frankfurt a/M., 1764, attributed cancer to the acid and corrosive deterioration of the lymphatic glands caused by the excess of hard, common acid or acid and fatty sulphuric substances contained in food and drink, including brandy, cider, etc. He also mentioned specifically the danger of an excess in a fish diet, particularly *trout* and eel, as well as oysters, bread, macaroni and pork. The importance of these early references lies in the recognition of the etiological significance of protein excess in diet, which was subsequently accepted by other writers, particularly Michel, Dunn, Williams, and others.* B. F. Günsburg, as early as 1853, held that the conditions responsible for corpulence were the same as those in carcinoma. In each of these he attributed the abnormalities of the metabolism to the excess of an albuminoid diet.

*J. Wolff, "Lehre von der Krebskrankheit," Jena, 1911, Vol. ii, p. 84.

OBSERVATIONS AND CONCLUSIONS

Cancer and Metabolic Disorders

The statistical correlation of variations in cancer frequency and errors and defects in the physiological economy of nutrition would be extremely difficult, if at all possible. The physiology of metabolism, regardless of a truly enormous amount of literature, is as yet far from having reached the position of an exact science. The term *metabolism* has been defined as "the collective chemical changes taking place in living matter. When these metabolic changes are constructive, as in the building up of tissue protoplasm from the absorbed food material, they are termed *anabolic*; when they are destructive, as in the breaking down of living matter, or in the decomposition of materials stored up in tissues and organs, they are termed *katabolic*." As further explained by Prof. Chittenden: "Proteid metabolism, or more exactly proteid katabolism, therefore, means the destructive decomposition of proteid or albuminous matter in the living body and is pratically synonymous with nitrogenous metabolism, since the entire nitrogen income is mainly supplied by the proteids or albuminous matters of the food.*

Based upon more general considerations the opinion has frequently been advanced by ancient and modern writers that there is a direct relation between diet and cancer frequency, and particularly has this been claimed to be the case in regard to the excessive consumption of salt and meat. The per capita rise in the meat consumption of the principal civilized countries has been referred to as a causative factor in the corresponding rise in the cancer death rate. The statistical evidence, however, of a precise correlation of cancer frequency to per capita meat consumption or its relative infrequency or rarity among vegetarians has not been established. As well said in an editorial in the New York Evening Post of July 1, 1914, "Admitting that meat eating in England has doubled during the last fifty years, there are a number of other changes quite as vital that have taken place in the same interval, and it would be the height of rashness to assume that this particular change was the determining factor." This argument is quite conclusive, since, as frequently pointed out, the precise correlation of any single factor to cancer frequency is extremely difficult, with the exception of such unusual forms of malignant disease as *Kangri* cancer, chimney-sweeps' cancer, X-ray dermatitis, etc.

Vegetarianism

The relation of vegetarianism to cancer frequency has been reported upon in considerable detail by W. R. Williams, in his treatise on "The Natural History of Cancer."† He observes that "It may be well to recall the fact that although cancer is remarkably rare in vegetarian communities, yet complete exemption cannot be claimed for such; and the like is true of herbivorous as compared with carnivorous." He, however, is convinced by overwhelming evidence "that the incidence of cancer is largely conditioned by nutrition." Investigations along this line of inquiry should be made with a due regard to the organ or part of the body affected. Nutrition is not likely to have any relation whatever to the occurrence of *Kangri* cancer or chimney-

*Chittenden, "Physiological Economy in Nutrition," p. 1.

†W. R. Williams, "The Natural History of Cancer," p. 350.

sweeps' cancer, but there is quite probably a determinable relation between gastric cancer and serious errors in nutrition and metabolism. Von Noorden holds "That a purely vegetable diet is not of advantage to the majority of mankind does not depend on any peculiar difference between the protein of plant and that of animal origin, but is the result rather of the presence of smaller quantities of protein in vegetable food, and an unequal and unsuitable distribution of the other important food stuffs present, as well as of certain mechanical intestinal disturbances which are often associated with a diet of entirely vegetable origin."* With special reference to the influence of cancer upon the digestive processes, Von Noorden mentions the investigations of Van der Velden proving the absence of free HCl in cases of cancer of the stomach, and the confirmation of this statement by many subsequent observers and its general acceptance at the present time as one of the most assured facts in the pathology of the diseases of the stomach. He points out that there are chemical changes in the gastric contents which result from the action of the products secreted by the new growth; that on the basis of a very extended series of observations it was shown that there was a marked diminution in the secretion of hydrochloric acid. "But," as he observes, "the question whether the development of cancer has any influence on intestinal digestion has never been closely and comprehensively studied, because the specific influence on the functions of the intestine, similar to that which has been believed to exist in the case of the gastric juice, had never been observed or asserted." "Clinical experience," he remarks, "teaches that cancer of the stomach is not necessarily followed by any intestinal disturbances, not even when characteristic changes of the gastric functions, such as a deficiency in HCl, a slight disturbance of the motility of the stomach, or again, a formation of lactic acid, could be clearly demonstrated." With reference to the development of cancer in the duodenum, in the gall-bladder, in the liver or in the pancreas, Von Noorden is of the opinion that these may be considered to be the cause of disorders of the biliary or pancreatic secretion.† Upon the important question as to the effect of the development of cancer upon the blood, he remarks that "During the development of cancer the blood frequently undergoes changes which manifest themselves clinically as a more or less severe anæmia. Here again it is especially cancer of the stomach that is associated with

*Von Noorden, "Metabolism and Practical Medicine," Vol. i, p. 3.

†For some extremely suggestive observations and conclusions on the relation of diet to cancer frequency under experimental conditions, see the paper on "The Rate of Tumor Growth in Under-Fed Hosts," by Peyton Rous, Proceedings of the Society for Experimental Biology and Medicine, May 17, 1911. Also, address on "The Relation of Diets and of Castration to the Transmissible Tumors of Rats and Mice," by J. E. Sweet, Ellen P. Corson-White and G. J. Saxon, from *Journal of Biological Chemistry*, July, 1913, and "The Influence of Diet on Transplanted and Spontaneous Mouse Tumors," by Peyton Rous, *Journal of Experimental Medicine*, No. 5, 1914. Rous observes that the experimental evidence "shows that the development of tumor grafts can in many cases be prevented or retarded by underfeeding the host or by putting it on a special diet." Corson-White and her associates conclude that "the unfavorable influence of poor nutrition (on cancer growth) as brought about by intercurrent disease upon the rate of growth of the transplanted tumor is a matter of general observation." They refer to the work of Mendel and Osborne, "who found in their studies of the effects of feeding rats with combinations of pure vegetable proteins a number of diets which completely retarded the normal growth of the animal, although the general condition seemed entirely normal," and they say that, "in other words, their animals were not starved in any sense except a very specific one—certain elements necessary to normal growth were lacking." The implication of these experiments is of far-reaching practical importance. They prove at least as regards rats and mice under expected condition *that the susceptibility to transplantable tumors may be influenced both positively and negatively by proper diets*, and the same conclusion applies to the rate of growth as well as to initial susceptibility.

anæmia, while cancer of the uterus and other internal organs come next in order." He remarks, however, that "Though the anæmia is by no means a constant symptom of the growth of cancer, some investigators insist on its being a specific effect of the hypothetical cancer toxin."*

Diet and Cancer Frequency

These extremely involved biochemical aspects of the cancer problem are largely outside of the field of statistical research. The value of the evidence, of course, is proportionate to the number of cases considered, and this is particularly true with respect to the comparative frequency of cancer among meat-eating and vegetarian races. In the discussion of the experience data of life insurance companies the fact was brought out that the proportion of deaths from cancer among Mohammedans in the experience of the Oriental Life Insurance Company of Bombay had been practically negligible, whereas among Europeans the proportionate mortality from this cause was 3.93 per cent. Williams, on the basis of a world-survey, came to the conclusion that the cancer death rate was invariably very low among people predominantly poor, of necessity very frugal, subsisting on an alimentation comprising but little proteid food. "A remarkable negative feature of reports regarding cancer frequency in India," according to the same authority, "is the almost complete absence from them of cases of malignant disease of the stomach (pylorus); and an equally noteworthy positive feature is the unusually great predominance of external cancers," particularly of the male generative organs. Out of 1,589 cases of cancer reported from India and analysed by the Imperial Cancer Research Fund, 1,513 involved the external surface of the body, and only 76, internal organs. The rarity of malignant tumors in India has been confirmed by the researches of Leonard Rogers, on the basis of an exhaustive study of the Calcutta post-mortem records. He found that malignant tumors cause only 2.9 per cent. of the deaths from all causes, or a very small proportion compared with European experience, partly accounted for by the low-age incidence of the subjects. Out of 1,000 autopsies, only 1 was a case of cancer of the stomach; 2, of the large bowel; 4, primary cancer of the liver; 3, primary cancer of the gall-bladder; 1, of the bile-duct; 4, of the pancreas, and 1, of the fallopian tube. All the diagnoses were verified microscopically. The data relate only to post-mortems, but it is pointed out by Rogers that cancer is also comparatively rare in the surgical series.

Out of 396 cases of carcinoma, in the experience of the Mayo Hospital, in Lahore, during the decade 1892-1903 (270 males and 126 females) 72 were cancers of the male generative organ (all Hindoos); 58, of the skin; 50, of the breast; 30, of the rectum; 23, of the uterus; 23, of the liver; 20, of the tongue; 13, of lip, cheek, mouth, and palate; 6, of the bladder; 5, of the pharynx; 5, of the larynx, etc. There was not a single case of malignant disease of the stomach in this apparently well-observed experience.†

*Von Noorden, "Metabolism and Practical Medicine," Vol. iii, pp. 797-805.
†W. R. Williams, "The Natural History of Cancer," pp. 34-35.

Influence of Civilization

The available evidence would seem to support the conclusion that malignant disease of the stomach is relatively much less frequent among non-flesh-eating races than among those not confined to a vegetarian diet. Bulkley, reporting the results of his studies during a rather extensive trip through the far East, states that although he met a large number of medical men and made personal inquiries at hospitals with a total of many thousands of patients, in Japan, Corea, China, Philippines, Siam and Egypt, he met everywhere with the same response: "Cancer was rarely seen among vegetarian peoples." This rather sweeping conclusion will hardly hold in regard to external cancers, or internal cancers other than those of the stomach and organs and parts directly related to the processes of nutrition. Bulkley, in a notable paper on "The Relation of Diet to Cancer," holds that "with advancing civilization the diet has become more and more complicated and luxury and over-eating have increased: this is especially true of meat-eating and alcohol and coffee drinking. . . . Among the well-to-do the meat consumption has been estimated at between 180 and 330 pounds per year. Already this is much more than double the amount consumed fifty years ago, and in the same time the deaths from cancer have increased over fourfold."* If meat-eating, as such, were a direct cause of cancer frequency, it would seem reasonable to suppose that the disease should be exceptionally common among certain tribes of North American Indians who, to an unusual extent, live upon a meat diet. As a matter of fact, cancer is apparently very rare among North American Indians, at least as far as ascertainable through the records of the Division of Vital Statistics of the United States Census. In the year 1910 there were 886 deaths of Indians, more or less of mixed blood, reported for the registration area, and of this total only 9, or 1.02 per cent., were deaths from cancer or other malignant tumors. Of this number 6 were cancers of the stomach and liver, or 66.6 per cent. of the whole. In contrast, out of 1,055 deaths from all causes among Chinese in the United States registration area in the year 1910, 44 were deaths from cancer and other malignant tumors, and of this number 19, or 43.2 per cent., were deaths from cancer of the stomach and liver. These data are confirmed by the investigation of the George Crocker Special Research Fund.

It must be considered extremely doubtful whether the operation of any single factor is sufficient to induce an excess in the normal frequency of cancer among human beings, even though the evidence may be quite conclusive that such a factor operates as a main contributory or accelerating condition. Overeating and, even more, overnutrition are unquestionably most important contributory causes in cancer occurrence. The principle of the physiological economy of nutrition has been admirably set forth by Prof. Chittenden in the statement that

> There is no question, in view of our results, that people ordinarily consume much more food than there is any real physiological necessity for, and it is more than probable that this excess of food is in the long run detrimental to health, weakening rather than strengthening the body, and defeating the very objects aimed at. . . . Physiological economy in nutrition means temperance, and not prohibition. It means full freedom of

*Bulkley's observations and conclusions on the metabolism of cancer and the relation of cancer to diet have recently been published under the title "Cancer—Its Cause and Treatment," New York, 1915.

choice in the selection of food. It is not cereal diet nor vegetarianism, but it is in the judicious application of scientific truth to the art of living, in which man is called upon to apply to himself that same care and judgment in the protection of his bodily machinery that he applies to the mechanical products of his skill and creative power.*

Theory of Atra Bilis

The possible biochemical causes of cancer have not as yet been sufficiently investigated to justify more than very general conclusions. The statement by F. W. Forbes Ross, that "so far as my researches on epithelial cancer have taken me, I have reason to believe that the disturbance of the potassium balance in the body is the cause, or one of the main causes, of epithelial cancer" is justified as a hypothesis, but not as a final conclusion. An equally interesting and possibly more conclusive observation in this connection has been made by E. F. Wright in his treatise on "Plant Disease and Its Relation to Animal Life": "It is clearly proved that there is a great difference in the composition of a healthy or normal bile and of the bile of one suffering from cancer." This conclusion, if sound, would go far to confirm the ancient theory of *atra bilis*, or the production of black bile by the renal and suprarenal glands, and its effect on temperament and predisposition to generate tumors of all kinds. The theory of black bile as a cause of cancer, which prevailed as a dogma until far into the eighteenth century, was a mere fancy of the imagination; but the theory that an abnormal condition of the bile may, under given conditions, be due to cancerous processes rests upon the substantial ground of precisely determined evidence.†

Biochemical Aspects

It is in the direction of qualified and special research of the contributory factors in nutritional disturbances and their relation to cancerous processes that the most valuable results of cancer research are likely to be had. If, for illustration, the theory of Ross is true, that the artificial or intentional regulation of the potassium balance in an apparently hopeless case of cancer will affect a profound change for the better in the disease, it is self-evident that such a hypothesis is entitled to much weight. The main object in all cancer research is the ascertainment of the whole truth of the cancer problem; but it is also important, and primarily so, to determine the factors or processes contributory, on the one hand, to an increase in the cancer death rate, and to the control of cancerous conditions, on the other.

The conclusion, however, by the same writer that the relative cancer death rates of England and Japan negative the theory of the influence of a vegetarian diet and cancer frequency is untenable, because of the fact elsewhere discussed that the mortality by organs and parts varies considerably in the two countries. For illustration, the average death rate for cancer of the stomach was 31.4 per 100,000 of population for England and Wales, 1906-10, against 40.0 for the Empire of Japan, 1909-10. In contrast, the mortality from cancer of the breast was 17.9 per 100,000 of women in England and Wales, against 1.8 for Japan.

*Chittenden, "Physiological Economy in Nutrition," pp. 474-475.

†For a full discussion of the theory of atra bilis, see J. Wolff, "Lehre von der Krebskrankheit," Jena, 1907, Vol. i, pp. 1-53.

Exophthalmic Goitre

A brief consideration seems here called for of goitre and its possible relation to the cancer problem. Goitre is an enlargement, particularly if hypertrophic, of the thyroid gland. Anæmic, or exophthalmic goitre, is a disease characterized by cardiac palpitation, tremor and a high pulse. The disease is more common among women than among men. The etiology is obscure. According to Gould and Pyle, there are three theories for the occurrence of exophthalmic goitre: 1, the *cardio-vascular*, 2, the *mechanical*, 3, the *nervous*. None of these explain the occurrence of endemic goitre, the etiology of which was reported upon in the Milroy Lectures, delivered at the Royal College of Physicians of London, 1913, by Robert McCarrison of the India Medical Service. This distinguished author examined minutely the nature of the goitrigenous agency in water and the source from which the same was derived. He considered the geological structure of the soil and its relationship to goitre, but he came to negative conclusions, to the effect that while the occurrence of goitre was very much more commonly associated with limestone and dolomite formations and with marine deposits generally, this association was not a constant one; for not only were these formations often entirely free from the disease, but goitre could and did prevail on almost every other geological formation, from the most ancient to the most modern. He was unable, also, to establish a correlation between the amount of any single dissolved ingredient in the water of goitrous communities that could be detected by chemical tests. He was willing to concede that hard water might favor the action of the goitrigenous agency, but he held that such waters were not capable by virtue of their hardness alone of causing goitre. In regard to radio-active substances in the waters of goitrous communities, he refers to the researches of Repin, and the conclusion that "These waters exercise on the general metabolism a powerful action of which the thyroid hypertrophy is the only reverberation." He quotes the same authority to the effect: "That goitrigenous water is invariably mineral water; that in this water exists some chemical ingredient—possibly salts of lime and magnesium, possibly radio-active substances—which is the active principle in the production of goitre." This view was not accepted by McCarrison, particularly on the ground of the researches of the Swiss Goitre Commission, which prove that "Goitrous waters almost invariably showed an infinitely higher bacterial content than innocuous waters," and the fact that in radio-active waters the bacterial content was low. Without enlarging upon the extremely technical aspects of the etiology of endemic goitre, it appears that the conclusion of McCarrison, based upon and sustained by the findings of the Swiss Goitre Commission, is that "Goitre-producing waters are eminently those in which micro-organisms find the nutrient materials for their life and growth."

Endemic Goitre in Fish

The importance of these considerations are emphasized in the value attached to the investigations by Gaylord and others, in cooperation with the United States Fish Commission, into the occurrence of endemic goitre, or more accurately, thyroid carcinoma among artificially bred

trout. McCarrison refers to the investigation by Marine and Lenhart, stating that "Overfeeding, overcrowding, and a limited water-supply, are the major factors in the production of filthy, unhygienic tanks or ponds, and the unsanitary, unhygienic and filthy tanks are in a very important but still unknown manner associated with the development of thyroid hyperplasia." Gaylord's observations were found to be in complete agreement with the findings of Marine and Lenhart. A table is given showing the increase in the prevalence of the disease from non-occurrence in the upper tanks to 3 per cent. goitrous in the first tank, 8 per cent. in the second, 45 per cent. in the third, and 84 per cent. in the fourth. These interesting results are further confirmed by the goitre investigations in the villages of Gilgit, India, made by McCarrison in 1905. In that case, there was "the same increased prevalence of the disease as the water became more polluted, and a diminution in the amount of the disease as a result of dilution of the impure water with fresh spring water." The markedly place-character of the disease, even in the case of trout, was therefore well illustrated. Marine and Lenhart had arrived at the conclusion, as a result of their observations, that goitre was "the symptomatic manifestation of a metabolic and nutritional disturbance, and that food was the major factor acting to bring about a fault of nutrition favorable for goitre development." This conclusion was not accepted by McCarrison, who considered it inconsistent with some of the facts and opposed to the theory advanced by him of a micro-organism as a satisfactory explanation of the development of the disease in artificially bred trout.

Thyroid Carcinoma*

Gaylord and Marsh of the New York State Institute for the Study of Malignant Disease, in an elaborate report on "Carcinoma of the Thyroid in Salmonoid Fishes," published by the United States Bureau of Fisheries, 1914, conclude that "The disease known as thyroid tumor, endemic goitre, or carcinoma of the thyroid in the Salmonidae, is a malignant neoplasm; that it occurs in fish living under conditions of freedom in populated areas; that when introduced into fish-breeding establishments it becomes endemic, with occasional epidemic outbreaks; that normal fish taken from the wilderness may be made to acquire the disease when placed in fish-breeding establishments where the disease is endemic; that the feeding of uncooked animal proteid favors and the feeding of cooked animal proteid retards the disease as compared with the uncooked; but that feeding alone is not an efficient cause." They therefore hold that "There must be a transmitting agent, probably through the water or food, or both," and that "By scraping the inner surface of water-soaked wooden troughs in which the disease was endemic, they secured an agent which from its action upon the mammalian thyroid when administered through drinking water was no doubt the cause of the disease in the fish confined in these troughs." They found that the agent

*The mortality from goitre in the United States Registration Area is 14.1 per 1,000,000 of population (1910-13). For males the rate was 3.0, and for females 25.8. For England and Wales (1911-12) the rate was 11.4 per 1,000,000 for both sexes combined; 2.1 for males, and 20.1 for females. For the Eastern States in the United States Registration Area the goitre mortality rate was 11.3; for the Southern States, 6.1; for the Central States, 20.2; for the Rocky Mountain States, 10.6; and for the Pacific Coast States, 12.4. The highest rates prevailed in an almost contiguous area, as follows: Michigan, 24.9, Indiana, 22.0, Ohio, 21.2, Wisconsin, 18.6, and Minnesota, 18.1. All of these rates are decidedly above the average for the registration area as a whole.

could be destroyed by boiling, and that fish in all stages of the disease were favorably affected in the direction of cure by the addition to the water supply in suitable concentration of mercury, arsenic or iodine. They therefore advance the very important general conclusion that the effect of mercury, arsenic and iodine in carcinoma of the thyroid in fish and the subsequent positive experiments with metals in mammalian cancer are probably the expression of a therapeutic relation of these elements to carcinoma. They found that certain species of the Salmonidae had an almost complete natural resistance to the disease, and that certain lots of fish of susceptible species show a high degree of immunity to the disease; that spontaneous recovery occurs in a considerable percentage of individuals; that removal from ponds in which the disease is endemic to natural conditions or a change to more natural food increases the percentage of spontaneous recoveries; and that such a recovery appeared to confer a degree of immunity against recurrence.* Following these extremely interesting and apparently thoroughly scientific investigations and conclusions, the authors maintain that the disease known as endemic goitre, or carcinoma of the thyroid, is endemic in a very high percentage of all trout hatcheries in the United States, and that "The occurrence of the disease in wild fish, its introduction into fish-cultural stations, its localization in certain troughs or water supplies, the method of its spread, its transmission to mammals, the efficacy of certain well-known inorganic germicides in the treatment of the disease, the destruction of the agent by boiling, the phenomena of the spontaneous recovery and immunity, strongly indicate that the agent causing the disease is a living organism." But they add, "No evidence has yet been produced to indicate the direct transmission of the disease from individual to individual."†

It has seemed advisable to add the foregoing rather extended observations on goitre in human beings and in the salmonoid fishes as an exceptionally interesting contribution to the theory that cancer and allied diseases are primarily conditioned by errors or defects in nutrition and metabolism, and that, therefore, the underlying principal cause of cancer frequency is a wide departure in modern life from the normal mode typical of primitive races, among whom, as far as known, cancer is in all of its forms of comparatively rare occurrence. A full discussion of this phase of the cancer problem does not come within the scope and plan of the present work. There is, however, an obvious possibility that statistical research, particularly in the direction of determining with precision the local geographical incidence of the disease and its direct correlation to the more important contributory factors, but especially to the diet and nutrition of the population affected,

*Bulletin of the U. S. Bureau of Fisheries, Carcinoma of the Thyroid in Salmonoid Fishes, p. 506.

†The subject of thyroid carcinoma and the cause of goitre in fish are briefly referred to in the Cancer Studies by the George Crocker Special Cancer Research Fund, Vol. i, pp. 242-243, as follows: "There are no evidences that the disorder was either infectious or contagious, but much in favor of the view that it was the symptomatic manifestation of a metabolic and nutritional disturbance. .. . . Limited water supply, overcrowding, and overfeeding *with a highly artificial and incomplete food.* The water of the hatchery was not intrinsically goitre-producing, because fish would not develop the disease unless at least the factor of overfeeding with an incomplete food were in operation, and because they recovered if the overfeeding and overcrowding were corrected, even though remaining in the same pond. Therefore it seemed probable that food was the major factor in bringing about some fault of nutrition favorable to goitre development, although it was impossible to suggest whet elements in the diet were implicated."

may prove of great practical value in the ascertainment of the specific factors or conditions chiefly responsible for an excess in cancer frequency in particular localities.

Cancer and Obesity

The evidence elsewhere introduced in this work regarding the correlation of overweight to cancer frequency is as yet inconclusive. As a single factor the importance of overweight in relation to cancer can easily be exaggerated. Obesity is, broadly speaking, "an excessive development of fat throughout the body, and it usually occurs after the prime of life, but it may be congenital, or may occur at any period of life." "Obesity," according to French's "Practice of Medicine," "is the peculiar state of body in which, probably as a result of abnormal nutrition, there is an excessive accumulation of adipose tissue. . . . The principal causes that lead to it are excess of food and drink, especially of starches, sugars and malt liquors, with deficient exercise, yet many fleshy persons are remarkably abstemious and some are overcome with fat in the midst of an active life." Overfeeding is here confused with malnutrition, which is not the exact equivalent of overnutrition.

Rabagliati emphasizes the importance of connective-tissue congestion and the relation, therefore, of cancer to rheumatism. He holds that wrong alimentation gains power as age advances, and that the increasing weight of authority is in favor of the view that cancer is a food disease. He brings out the important point that the reason why cancer is rare in childhood and early life is because the irritation of the organism is accompanied by intolerance and followed by infectious fevers and inflammation, whereas in middle life "the organism being weighed down and oppressed by the excessive load it is compelled to carry, and the tissues being somewhat resistant, it does not intolerantly react against the irritation into a high fever, but on the other hand is simply depressed by it." He explains why cancer becomes less common over 65 years of age by holding that "persons by that time have learned how to live, and those who have not learned or who would not learn have been swept away by some of the chronic, or by some of the acute illnesses." His final conclusion is that "Too many meals, and especially when they contain too large a proportion of the carbonaceous and fermenting foods, form a main part of the predisposing cause of cancer."

Alcohol and Chronic Irritation

Abuse in food and abuse in drink are closely related. Chronic irritation as a result of overindulgence may safely be considered a predisposing factor in at least the occurrence of cancer of the stomach. Some early writers on cancer attributed the disease to the general use of acid wines and cider. The available evidence, however, is not conclusive, further than that excessive indulgence in alcoholic drinks is quite likely to produce a chronic gastritis, which requires to be considered as a precancerous disease. Hepatic cirrhosis is induced in chronic alcoholism in many cases, but especially in those who habitually take whiskey undiluted into an empty stomach. This habit is certainly not very general in this country. The common use of raw whiskey has been connected by Boas with cancer of the œsophagus. Reyburn, in an interesting discussion of the medical treatment of cancer considers the influence of alcohol as a predisposing

cause in cancer, particularly as regards the insidious and dangerous effect of alcohol on the tissues, even from small quantities, when taken regularly, and the effect of alcohol *in the dilute form* to enter into the blood and then circulate in the blood through every tissue and organ of the body.* He therefore concludes that the effect of this is that "The alcohol, by powerful affinity for the water of the tissues, dehydrates and prematurely hardens them; not only this, but alcohol is a retarder of waste in the body." Sir Alfred Pearce Gould, in the Bradshaw Lecture on Cancer, reported in the *British Medical Journal* for December 10, 1910, considers alcohol an etiological factor of considerable importance. Referring to the occupational mortality statistics, according to which persons connected with the liquor traffic show an exceptionally high mortality figure from cancer, he concludes that "the cancer incidence in any trade varies with the attendant habits as regards alcohol," and from the point of view of chronic irritation, X-rays and alcohol—these so-called causes of cancer—agree in being conditions that wear out the cells of a part: they add to the number of cell generations, they deteriorate the evolution of the individual cell, they appear to lessen the hold over the cell of the great primal cell law, and singly or in combination they cause cancer. There is serious risk, however, in carrying this conclusion too far. A few years ago a report was published on the experience of Inebriate Asylums in England, according to which "the mortality from cancer was more than eight times greater than that which obtains throughout the country." This startling conclusion was subjected to critical analysis in a Second Study of Extreme Alcoholism in Adults, by David Heron, Galton Research Fellow, of the Francis Galton Laboratory for National Eugenics, with the result that the very opposite conclusion was arrived at, or in other words, the frequency of cancer was found to be less among inebriates than among the general population. Bainbridge points out that the prejudicial influence of alcohol on cancer is a debatable question, but he observes, "In the case of the alimentary canal, at any rate, this possibility has been practically established by the greater frequency with which males suffer from cancer of the upper half of the alimentary canal and stomach, especially in occupations prone to alcoholic indulgence."† Hastings Gilford, in his treatise on "Disorders of Post-Natal Growth and Development," concludes that there is no clear evidence that cancer in general is due to the drinking of alcoholic intoxicants. He quotes Dr. Snow‡ as one who in common with many other observers believes that alcohol has a conspicuous share in giving rise to cancer of the lips and tongue. He also quotes Sir Victor Horsley, to the effect that "There is a great excess of [malignant] disease in persons employed in those occupations in which alcoholic indulgence is common," and "This is not surprising when we remember that one of the factors producing cancer is the influence of chronic irritation, and alcohol causes irritation of the tissues with which it comes in contact." There can be no question of doubt but that alcohol is a cause of degeneration, and Gilford elsewhere observes that "the tissues of the alcohol drinker are more vulnerable than the water drinker, and that, furthermore,

***Journal of the American Medical Association*, November 10, 1906.

†William Seaman Bainbridge, "The Cancer Problem," p. 81.

‡*The Lancet*, 1904, Vol. ii, p. 822. (See also "Disorders of Post-Natal Growth and Development," p. 162.)

the stimulating effect of alcohol is to a large extent the result of an increased flow of blood, not founded on physiological reasons, and any increase of gastric juice, any extra warmth of the skin or exaltation of mind so produced is pathological, for it is due to a morbid congestion and not to a natural flush. The action of alcohol upon the healthy stomach is essentially that of a disorder, and carries with it all the evil which the word implies."

In the cancer investigation in Baden one of the predisposing conditions determined with approximate accuracy was alcoholism, which accounted for about 7.5 per cent. of the cases returned for the year 1904 and 6.25 per cent. for the year 1906. In contrast, nicotine abuse, or smoking in any form, was accounted for in only 1 per cent. of the cases for 1904 and 0.75 per cent. for the year 1906. Even chronic inflammation and irritations caused by gall-stones, etc., accounted for a smaller proportion of cases than alcoholic misuse.

Smoking and Chronic Irritation

Alcohol and tobacco are unquestionably sources of chronic irritation in the mouth and throat. The relation of smoking to cancer of the buccal cavity is apparently so well established as not to admit of even a question of doubt. Betel-nut chewing may here be referred to as an etiological factor within the same category. As pointed out by Childe, in his treatise on "The Control of a Scourge," if oversmoking, or smoking at all, irritates the mouth and tongue and gives a feeling of soreness, it is advisable to discontinue the practice, and he particularly suggests the abolition of the clay pipe. The subject was inquired into in connection with the special cancer investigation in Ireland, published as a supplement to the thirty-eighth detailed annual report of the Registrar-General, Dublin, 1903. On the basis of this investigation the conclusion was arrived at "that in some cases cancer has supervened where there has been irritation of the lip consequent on smoking clay pipes. W. R. Williams in summarizing the available evidence on the relation of smoking to lingual and buccal cancer, concludes, however, that intrinsic causes are much more important factors in the origination of cancer than extrinsic ones, which are by no means its necessary antecedents. The fact, however, that the mortality among males from cancer of the buccal cavity is almost invariably greatly in excess of the corresponding death rate for females is in itself indicative of the etiological importance of smoking. An extremely suggestive illustration in support of this conclusion is the relatively high mortality from cancer of the buccal cavity among aged negro women in the District of Columbia, who are given to the smoking of clay pipes; this habit is practically unknown among white women. For ages over 40 the death rate for cancer of the buccal cavity in the District of Columbia was 3.3 per 100,000 of population for white women, against 8.4 for colored women; but at ages 70 and over the rates were 8.6 and 30.1, respectively.*

W. S. Lazarus-Barlow in the Croonian Lectures on Radio-Activity and Carcinoma, calls attention to the fact that the liability to cancer of the lip undergoes no diminution in old age, such as is observed in the case of carcinoma in all other sites examined by him. This he considers strong

*"Menace of Cancer," p. 24

evidence that some fundamentally different condition obtains in the two situations, and he therefore concludes that "The persistency with which the old man clings to his pipe, holding it between his lips, whether actually smoking or not, whether awake or dozing, as he sits in the sun or by the fireside, is as characteristic of the ages above seventy as is the toothless condition which commences to set in about 65. On the assumption that the pipe is in some way related to carcinoma of the lip, while the teeth are in some way related to carcinoma of the tongue and other parts of the mouth, the curve of liability to this disease in the two situations should be exactly as we find them to be."*

These conclusions of one of the foremost students of the cancer problem are based in part upon the results of extended studies regarding the radio-active properties of clay pipes, which, however, are too technical to be more than referred to. Dr. Louis Bradford Couch in a contribution to the *Medical Times*, November, 1911, approaching the subject from another point of view, points out that the smoking of tobacco produces CO and CO_2. "The latter," he remarks, "unites with the watery secretions of the mouth and lips, forming carbonic acid, the same factor involved by fermentation in the traumatized tissues, while the mechanical pressure of the pipe held regularly in one place on the lip, causes blood stagnation and local fermentation and poisoning by its resulting gases." He also directs attention to a fact of considerable interest, in support of which, however, the required statistical evidence is not given, that "Cancerous growths always occur on the lower lip, never on the upper lip,"† which fact, he contends, "corroborates my theories as regards the importance of pressure and fermentation." In other words, "The irritating character of the nicotine and pyridine that bathe the stem of the pipe as it presses on the lip, are factors of importance. In smokers' cancer there are three active causes at work, i. e., the pressure of the pipe inducing stagnation of blood and fermentation of the tissues; nerve irritation induced by nicotine and pyridine; the mucous absorption of the gases of combustion, which alone and unaided cause vascular paralysis, resulting in fibrous exudations, which, becoming organized, cause the tumerous growth."

The relation of cancer of the buccal cavity, and particularly of the lips, to smoking habits was also considered in the German Cancer Census of 1902. The conclusion is advanced that the greater frequency of cancer of the lips among men is directly attributable to the smoking habit, and the evidence of tobacco misuse was apparently established in nearly 16 per cent. of the male cancer cases. It is pointed out, however, that the habit of smoking is not to be considered a direct causative factor, but only in the sense of being a contributory one, in identically the same way as it is held that alcoholism requires to be considered a contributory instead of a direct cause in cancer frequency.

Gall-stones and Chronic Irritation

The foregoing considerations emphasize the practical possibilities of an extension of the method of qualified statistical research to special phases

*British Medical Journal, June 26, 1909.

†The accuracy of this statement, however, is seriously questioned by one of the foremost authorities on this particular aspect of the cancer problem. The statement is of special significance as an indication of the practical importance of detailed statistical data regarding the precise location of the cancerous growth.

of the cancer problem. Most of the theories advanced with regard to special contributory factors in cancer occurrence are insufficiently sustained by the necessary statistical evidence. The precise seat of local irritation should in all cases be correctly determined, but unfortunately it is in this direction that most of the general cancer studies fall short of the required degree of scientific conclusiveness. The confusion of cause and effect is as common in the cancer problem as in tuberculosis. The several factors in their interrelation are no doubt often obscure. The division by Dr. William J. Mayo of local irritation into, first, congenital or acquired neoplasms, such as moles, warts and benign tumors, which might undergo malignancy, second, trauma, which strongly influences the development not only of sarcoma but also of carcinoma, third, chronic irritation, which is perhaps the most important of all precancerous conditions, whether the result of mechanical, chemical or infectious agencies, is suggestive of the extreme complexity of the biological aspects of the cancer problem statistically considered. Among the illustrations given by Mayo are cancer of the gall-bladder from gall-stone irritations and cancer of the stomach following gastric ulcer. He points out that 50 per cent. of cancers of the pelvis and of the kidney were demonstrably superimposed on extensive renal calculi formation. He points out further that carcinoma of the appendix usually occurs in association with chronic obliterative processes, and in the sigmoid and rectum, the irritation in diverticula may have given rise to malignant disease. In each of these particular phases of the cancer problem further research would seem especially desirable, due attention being given to elementary principles of statistical analysis.

Cancer and Tuberculosis

The relation of cancer to certain other important diseases is a field of research which as yet has received only superficial or incidental consideration. Foremost among the diseases related to cancerous processes or assumed to be favorable or antagonistic to cancer occurrence are tuberculosis, syphilis, leprosy,* gout, rheumatism, diabetes, malaria and appendicitis. The early writers on the cancer problem considered scrofula as a primary predisposing cause, but during the nineteenth century this point of view changed to the opposite, on the basis of the homeopathic principle in medicine that two dynamic affections can not occur at the same time; in other words, the less persistent disease must yield to the stronger. This view was shared by Hunter, who, according to Wolff, held that the human body could be affected by only a single specific disease at one time. These conclusions were subsequently set aside by the evidence of coincident diseases, though, of course, coexisting to a variable degree of virulence. Tuberculosis and cancer may occur in the same person at the same time, but the coincidence is apparently not common. This coexistence of two diseases is possible not only in the body as a whole, but in any particular organ or part. The main factor

*Personal inquiry at the Molokai leper settlement has failed to substantiate the view that there is a correlation of cancer to leprosy. Leprosy as a precancerous condition has been reported by Blaschko, but apparently the conclusions have not been generally accepted. J. W. Vaughan mentions Guy de Chauliac (1300 A. D.) as having declared that cancer was closely allied to leprosy, but no evidence in support of this theory has been produced. The age and sex incidence of leprosy follows an entirely different law from that of cancer, and the disease is most common among indigenous races, who, as a general rule, are relatively free from malignant disease.

of etiological importance in connection with the two diseases is that tuberculosis occurs most frequently at young ages and cancer at ages over 45. In the United States registration area in the year 1913, out of 93,293 deaths from tuberculosis, 73.39 per cent. occurred at ages under 45, and 26.61 per cent, at ages over 45. Out of 49,887 deaths from cancer at all ages, 15.46 per cent. occurred at ages under 45, and 84.54 per cent., at ages over 45. In so far as disease is a function of age, tuberculosis and cancer follow apparently opposite laws of frequency occurrence. Among the most recent statistical studies, according to Wolff, are the data of Goupil, who determined a proportion of 9 per cent. of tuberculosis cases in 622 cases of cancer. According to the investigations of Cahen, based upon 4,233 autopsies, the proportion of coincident cases of cancer and tuberculosis was only 5 per cent. Other investigators have found as high as 20 per cent., and W. R. Williams records 12.5 per cent. It would seem, however, that according to the more recent investigations the combination of tuberculosis and carcinoma is much less than according to the earlier studies. This, in part, may be explained by the diminishing frequency of tuberculosis and the increasing frequency of cancer. In this respect, the two diseases also follow apparently opposite laws of frequency occurrence. The mortality from tuberculosis of the lungs in American cities during the last thirty years has declined from 319.3 per 100,000 of population to 157.5, or 50.7 per cent., whereas the cancer death rate of these cities during the same period of time has increased from 46.9 to 85.4, or 82.1 per cent. Much the same tendency is met with in other representative civilized countries.

The theory of antagonism between cancer and tuberculosis was first promulgated by Rokitansky.* Summarizing the results of his own investigations, Rudolph Schmidt, in his treatise on "Tumors of the Abdominal Viscera," observes with reference to the theories of Rokitansky that "Individuals with well-developed progressing tuberculosis of the lungs are extremely unlikely to have carcinoma. On the contrary, healed apical lesions and other stationary healed tubercular processes, or such as incline to healing, especially those of glands and bones, are decidedly not rare in cancerous patients."

Among recent studies of the association of tuberculosis and malignant growth a reference may be made to the work of W. H. Harris of New Orleans.† The results of Harris's investigations are briefly summarized in the statement that "The tuberculosis formed a primary pathologic soil on which the tumor probably thus provoked continued to flourish and the tuberculosis in part yielded to the cancerous affection."

Cancer and Syphilis

The possible correlation of syphilis to cancer has also not been accurately determined. The earliest investigation, as stated by Wolff, was by

**Journal of Medical Research*, Boston, 1913.

†The extreme rarity of coincidence in cancer and tuberculosis is best illustrated in the actual experience of The Henry Phipps Institute of Philadelphia. From the opening of the Institute in 1903 to January, 1915, there have been 633 autopsies performed, including a very small percentage of individuals who did not have tuberculosis. According to Dr. H. R. M. Landis, Director of the Clinical and Sociological Departments, "Of the entire number there was but one instance of malignant disease, and this case was of a woman who at the autopsy was found to have a number of nodules in the lung, which had had their origin in a small scirrhous carcinoma of the left breast. This woman had no tuberculosis whatever." In other words, in the experience of this thoroughly representative institution there have been no cases in which tuberculosis and malignant disease coexisted.

Leroy d'Etiolles, who according to French experience held that out of five syphilitics one would be afflicted with cancer. The importance of considering the possible coexistence of syphilis and cancer, with a due regard to the organ or part of the body affected by the disease, was discussed by Poirier in 1907, in a description of 32 cases of cancer of the tongue in 27 cases of which syphilis was a predisposing or precancerous condition. Fabre, as early as 1777, attempted to prove that syphilis was an important factor in cancer causation, and since that time many writers have contributed the results of their observations for the same purpose. Horand has reemphasized the importance of considering the relation of syphilis, with a due regard to the site of the cancerous growth, but no evidence has apparently been produced to show that syphilis must be considered a specific predisposition to cancer, further than that all imperfectly healed lesions or cicatrixes are liable to assume a malignant form in course of time. Other writers on the subject have advanced opposite conclusions, including W. R. Williams, who observes that in the course of his investigations into the life-history of female cancer patients he has been struck by the extreme rarity with which signs of syphilis are met in such persons. Thus, out of 325 female cancer patients consecutively under his observation, not a single one had been addicted to prostitution, so far as he was able to ascertain; and, what was more remarkable, only a single one presented signs of having had syphilis. Moreover, according to this same authority, out of 160 uterine-cancer patients, only one presented signs of having had syphilis. Other indications furnished by a careful study of the life-history of these patients clearly show that they are seldom the victims of syphilis. He therefore concludes that "The victims of constitutional syphilis are much less prone to cancer than the non-syphilitic. And this comparative immunity of the syphilitic is probably due to the depraved nutrition and lowered vitality, caused by contamination of the system with the syphilitic virus."

The subject is referred to by David Heron in his monograph on "Extreme Alcoholism in Adults." The investigations by Dr. Branthwaite are mentioned as raising a very interesting point in discussing the relationship between prostitution and cancer of the mammary and generative organs. It is stated by Heron that "After correcting for differences of age distribution, we find that 71 per cent. of the cancer among inebriates affects those organs while in the general population the proportion is 53 per cent. Among inebriates who are prostitutes the percentage rises to 87.5 per cent. compared with 52 per cent. in the general population." It is admitted, however, that the numbers are small and do not justify further analysis; but the point is recognized as important and, it is suggested, should be tested on the basis of more adequate statistical material. Following these observations, however, it is pointed out that "None of those prostitutes who had cancer are marked as having had syphilis also, but it is not quite clear from the report whether other and less severe forms of disease have been recorded in addition to the principal disease." Reference is made to the conclusions arrived at by Prof. Rutherford Morison that "Cancer and syphilis are very firm allies and syphilis often provides a suitable site for the lodgment of

cancer. If a person over 60 years of age contracts syphilis, his death from cancer may be anticipated." Heron also refers to the conclusions of Dr. F. von Esmarch as still more emphatic, and to the effect that in his experience during recent years in his own clinic he had observed in cases of sarcoma that more than one-half of the patients had been syphilitics, and that they were cured through antisyphilitic treatment. It is obvious that these conclusions rest upon inadequate data, subjected possibly to a faulty statistical analysis. The cases of Von Esmarch may have represented an exceptional class of women, for there is no evidence to prove that syphilis would be met with to anything like the proportion stated by him in the ordinary run of male or female patients of a general hospital or of a large private clinic. The subject is one well deserving of further study and research, but as far as the present available evidence permits one to judge, the relation of syphilis to cancer is only remote. This view is sustained by the observations of Rudolph Schmidt, who remarks that his personal impression is that "So far as the clinical study of malignant neoplasms is concerned, luetic antecedents are not frequent."

Cancer and Rheumatism

The statistics of rheumatism and gout in their relation to cancer are fragmentary and inconclusive. Recamier, according to Wolff, considered gout a predisposing factor in cancer, particularly in the case of women. Bazin as early as 1858 attempted to correlate the two diseases, but apparently upon an inadequate statistical basis. Beneke, in 1875, and Vigouroux, as recently as 1906, have brought forward evidence in support of this contention. According to the last-named writer, as quoted by Wolff, cancer and arthritis are closely related; in fact, he goes so far as to maintain that the majority of cancer patients suffer from some form of arthritis, the fact, apparently not being given due consideration, that rheumatic afflictions are as such largely incidental to advanced age. The term *arthritism* as used by these writers is quite comprehensive, and apparently includes such widely different diseases as gall-stones, dyspepsia, diabetes, heart diseases, etc. Neither statistical nor clinical evidence has been brought forward in adequate support of this important contention.

In a discussion on "Cancer in New Zealand," Hislop and Fenwick* observed, with particular references to cancer-houses, that "*So many of the cases were rheumatic, and rheumatism was so prevalent in subacute or chronic forms in bush districts, that we can hardly ascribe the coincidence of rheumatism and cancer to an accident.*" They add the rather suggestive observation that "It is not impossible to imagine that the circulation of the blood in rheumatic cases may act as a direct irritant to tissues." It may be said in this connection that dampness has frequently been alleged to be a contributory cause in excessive cancer frequency, and the theory has been advanced that well-wooded countries are almost constantly the areas of high cancer mortality, and that isolated houses surrounded by trees especially harbor the disease. Childe, in his treatise on "The Control of a Scourge," draws attention

*British Medical Journal, October 23, 1909.

to the close connection of "low-lying districts and trees as a cause of cancer," but he remarks that the contributory cause was more likely dampness, and he quotes the results of an analysis of 100 cases of cancer of the breast, in which 30 per cent. showed a well-marked history of exposure to dampness in some form or other, and he makes the rather unpractical suggestion that "Women should not reside in places with a damp climate, or where mists and fogs prevail."

The relation of rheumatism to dampness is too well established to require explanation. Dampness as a contributory cause in rheumatism may, therefore, occur as a mere matter of coincidence in a relatively large number of cancer cases. In his classical treatise on the "Geography of Heart Disease, Cancer and Phthisis," Haviland drew attention to the coincidence of an excess in cancer frequency in the sections of England more or less subject to periodical inundation, and a consequential resulting dampness. He laid down the important principle that "Cancer does not thrive on high, dry soil," and furthermore, that the facts prove that "Rheumatism is the forerunner of the great mass of heart disease," and that in cancer, "The high, dry sites on the older rocks are the places where cancer does not thrive, and that it does thrive in the vales by the sides of large rivers which overflow their banks, and in the neighborhood of which are to be found the drifts of ages of washings from the inhabited country above." No exhaustive statistical investigations have been made to establish with a reasonable degree of scientific conclusiveness the coincidence of cancer and rheumatism in low-lying, damp, ill-drained sections of the country subject to a heavy rainfall, in contrast to high-lying, well-drained and semiarid regions. Much general information is available, however, to prove that cancer in the former regions is more common than in the latter.*

Cancer and Gout

Gout, as perhaps the best illustration of malnutrition, may by inference be considered a precancerous symptom. But what is true of gout is equally true of cancer; as observed by Von Noorden, in his treatise on "The Pathology of Metabolism," "The leading scientific investigators have devoted their best efforts to the solving of the questions dealing with the theory of gout, yet our knowledge concerning its metabolic processes stands in marked contrast to the amount of thought expended upon the elaboration of its theory." The anomalies of the metabolism of gout, especially with reference to uric acid, may possibly be found to correspond to similar conditions in cancer. It is significant, however, that in England, where in the past gout has been most common, the mortality from this cause should have been on the decrease during years in which in contrast there was a marked rise in the mortality from cancer. The death rate from gout among males in England and Wales has declined from 3.7 per 100,000 in 1891 to 1.8 in 1910. The combined death rate from all forms of rheumatism, including rheumatic gout, has declined from 12.6 per 100,000 in 1891 to 7.9 in 1910. In contrast, the mortality from all forms of cancer, including sarcoma, has increased during the same period from 51.8 per 100,000 to 85.7. It is remotely possible, of course, that

*See also the discussion under topography, on page 196.

there has been a transference of cancer cases formerly classified under gout or rheumatic affections to the cancer group, but the evidence is quite conclusive, as a matter of general observation, that the typical form of gout so common in England 30 years ago is relatively less frequent at the present time. In 15 cases of applicants with a record of gout in their personal history in the experience of the Mutual Life Insurance Company, 2 died from gout; 4, from heart disease; 1, from Bright's disease; 2, from dropsy; 1, from apoplexy; 4, from acute rheumatism; and 1, from tumor of the liver, but whether malignant or not is not stated. The evidence in this case would, therefore, have to be considered negative. The same conclusion applies to most of the available data regarding the possible relation of cancer to gout and other rheumatic affections. As yet, however, no thorough study has been made of the comparative frequency of cancer and rheumatic affections in typical semiarid and humid localities, with a due regard, of course, to the organs and parts of the body affected by malignant disease.

Cancer and Diabetes

There is also apparently a well-defined correlation between diabetes and cancer. The conditions responsible for nutritional disturbances may possibly be in part the same in both diseases. One of the contributory factors of considerable importance in diabetes is unrestricted "eating and drinking," or, in other words, overnutrition. Diabetes is usually rather frequent in the Hebrew race, but this is apparently not the case with cancer. "The pathogenesis of the disease," according to Savill, "is not at present known," but it is certain that the pancreas is fibrotic in about 50 per cent. He adds that physiological evidence points in this direction, and that the glycogenic function of the liver is in some way interfered with, possibly indirectly through the pancreas. The disease occurs chiefly among the well-to-do, and in the proportion of three males to two females. According to Gould and Pyle, "occasionally there are lesions of the pancreas, but usually no anatomic lesion can be found." The complications of diabetes are numerous, but they apparently do not often include cancer. The chief treatment is dietetic, and consists in the reduction of sugars and farinaceous foods. No such treatment, apparently, would be of much value, if any, in cancer. A high correlation between the death rate from cancer and diabetes was brought out in a statistical study by Dr. G. D. Maynard, of Johannesburg, South Africa.* The evidence, however, can not be considered entirely conclusive. W. R. Williams remarks in this connection that

*The original paper by Maynard was published in *Biometrika* for April, 1910. Among the conclusions advanced are the following:

1. That recorded differences in cancer and diabetes death-rates, as applying to different districts and cities of the U. S. A., as well as the increased rates observed in recent years, do indicate real differences in the prevalence of the disease.

2. The correlations found to exist between cancer, diabetes and insanity are not fortuitous and due merely to errors of observation or record.

3. The statistics dealt with in this paper do not give any support to the suggestion that cancer is of infectious origin.

4. That whatever theory as to the causation of cancer is adopted, some explanation of the remarkable correlations between cancer, diabetes and insanity is required.

5. The explanation suggested to account for the facts as disclosed by statistical analysis is that conditions of modern life, acting on physiologically unsound material, may account for the correlations existing between these three diseases, as well as for their increasing rates.

it is interesting to note that "Of late many instances of the association of malignant tumors with diabetes have been reported, and most of those who have specially studied the subject maintain that the diabetic state favors the development of malignant disease." He points out that it is well known that malignant tumors "are rich in glycogen, and that the blood of those who bear these tumors contains an excess of sugar-forming substances." In his own experience, however, Dr. Williams noticed the diabetic state in only a few of his numerous cancer patients, and he remarks that other pathologists have also called attention to the rarity of this conjunction, "even when the pancreas is the seat of malignant disease, diabetes is far from common." The statistical evidence is very limited, but reference may be made to Boas, a German observer, who reports that of 366 patients with intestinal cancer, 12, or 3.3 per cent., were also affected with diabetes. Williams quotes 62 cases collected by Kappeler, according to whose investigations the seats of the cancerous disease complicated by diabetes were as follows: breast, 18; mouth, 12; stomach and liver, 12; uterus, 3; rectum, 2; colon and ovary each in 1 case. The same writer quotes Frerichs regarding the cause of death in 200 diabetic patients, of whom only 6, or 3.0 per cent., died of cancer. Gilford,* in his discussion of diabetes and its association with acromegaly, liver cirrhosis, obesity and senilism, makes no reference to cancer. The evidence, therefore, as far as available, would seem to indicate that the actual correlation of cancer to diabetes is comparatively slight.

In contrast to the absence of conclusive evidence of such correlation, the increase in the mortality from diabetes in civilized countries corresponding, more or less, to the increase in cancer frequency, is of considerable interest, at least as a problem in statistics.† In England and Wales during the period 1900-12, the cancer death rate increased from 82.9 per 100,000 to 102.2, or 23 per cent., whereas the diabetes death rate increased from 8.6 to 11.1, or 29 per cent. In ten registration states of the United States during the period 1900-12, the cancer death rate increased from 63.8 to 85.3, or 34 per cent., whereas the diabetes death rate increased from 11.0 to 17.6, or 60.0 per cent. Since diabetes is much more common among Jews than Gentiles, the material increase in the diabetes mortality in the ten states referred to is, no doubt, due in part, to the large Hebrew immigration during recent years. That this, however, can not be the only explanation, if it is any explanation at all, is shown by the statistics for Norway. In that country the cancer

*Hastings Gilford, "The Disorders of Post-Natal Growth and Development," London, 1911.

†The following comparative cancer and diabetes mortality rates are derived from official sources for the period 1908-12:

Mortality from Cancer and Diabetes
1908-1912

	Cancer		Diabetes	
	Deaths	Rate per 100,000 Population	Deaths	Rate per 100,000 Population
United States of America (16 States)	150,750	76.3	30,047	15.2
England and Wales	174,602	97.6	19,149	10.7
Norway	11,461	97.4	865	7.2
Australia	16,096	73.2	2,006	9.1

death rate increased from 90.8 to 104.8, whereas the diabetes death rate increased from 5.1 to 8.0. Cancer increased 15 per cent., against an increase of 57 per cent. in the mortality from diabetes. Still more suggestive are the changes in the cancer and diabetes death rates of the Commonwealth of Australia (1900-12). Cancer increased from 62.6 to 76.1, or 22 per cent., whereas diabetes increased from 4.2 to 10.1, or 140 per cent. The evidence, while inconclusive regarding a possible relation of cancer to diabetes, or *vice versa*, is of exceptional interest in view of the recognized underlying serious nutritional disturbances in both diseases.

Cancer and Appendicitis

The possible relation of cancer to appendicitis has been a matter of much interest for many years to students of the cancer problem. Howard A. Kelly, in his treatise on "Appendicitis and Other Diseases of the Vermiform Appendix," calls attention to the fact that "The number of cases recorded of primary tumors in the vermiform appendix is small, but during the past few years, since the operative treatment of right iliac disease and careful routine, laboratory examination of the removed organs has become general, it has been found that they are by no means so rare as formerly supposed." He also remarks that since 1898 "a considerable number of cases of malignant neoplasm limited to the appendix have been carefully described, while secondary involvement of the organ is comparatively common." According to the same authority, however, it would appear that benign tumors are extremely rare. The investigations by Maydl and Nothnagel, concerning the occurrence of primary carcinoma of the appendix, as shown by autopsy records, are referred to, it being stated that out of 40,738 autopsies made at the Vienna General Hospital during the twenty-two years, 1870-92, only two cases of carcinoma of the appendix out of 343 instances of cancer of the digestive tract were found. During recent years the evidence from numerous sources has been rapidly accumulating, tending to show in the words of Dr. Kelly, that "Primary carcinoma of the appendix is not such an uncommon disease as has hitherto been supposed to be the case." "Mechanical irritation," he remarks, "appears to play an unimportant role in the development of tumors of the appendix." He points out, however, that "Considering the frequent occurrence of carcinoma following stones in the gall-bladder and bile-ducts, it is surprising how few cases occur similarly in the appendix." He refers to the ages at which malignant tumors of the appendix develop, it being shown that the large majority occur between the tenth and the fortieth year, or to be specific, out of 69 patients 58, or 86 per cent., occurred during this period of life. It is, of course, well known that the average age at death in appendicitis is much lower than in malignant disease, and the age distribution of deaths follows a distinctly different curve in appendicitis than in carcinoma. According to Rudolph Schmidt, the diagnosis of malignant tumors of the appendix is difficult on account of their small size, for apparently "they do not lead to metastases and do not show unlimited growth." He therefore concludes that such tumors can hardly be looked upon as "malignant" in a clinical sense, even though they bear their histological characteristics. Dr. John A. Lichty of Pittsburgh,

in a discussion of the pathological relation of ulcer to carcinoma of the alimentary canal,* calls attention to the fact that in only 20 out of 5,000 cases of appendicitis was malignancy established. Mayo in an address on "The Prophylaxis of Cancer,"† refers to the investigation by MacCarthy showing that out of 5,000 removed appendices for so-called chronic subacute appendicitis, only 0.5 per cent. were carcinomatous, although the external appearance of these appendices did not always indicate such a condition. The subject was quite fully discussed in an editorial in the *Journal of the American Medical Association*, January 14, 1911, in which the results of a careful study are summarized in the statement that "Statistics from large clinics, where great numbers of appendices are removed and thoroughly examined, have shown with remarkable uniformity that not far from 0.5 per cent. of all appendices removed for all causes show thickenings, nodules or tumor masses which exhibit a microscopic structure warranting the pathologist in returning a diagnosis of cancer." It is observed, however, in this connection that "Of late there has been a growing doubt as to whether, after all, these epithelial neoplasms in the appendix are true cancers, in spite of the typical invasion of the connective and muscular tissues by strands of columnar or spheroidal cells." Reference is made to a discussion at a meeting of the German Pathological Society in 1910, at which Winkler reported that he had "found at autopsies no less than six appendices showing changes of the type usually diagnosed as carcinoma, yet in none of these cases was there evident regional infiltration or local or remote metastases." The subject has also been discussed at a comparatively recent meeting of the Edinburgh Medico-Chirurgical Society, at which the new evidence presented was largely in the negative, and this may be summarized in the brief statement that "Cancer of the appendix, especially in spheroidal-celled cases, must be of a naturally benign type, comparable to rodent ulcer, locally invading but rarely giving rise to metastases."

Parasitic Theory of Cancer Causation

All studies of cancer frequency in correlation to other diseases are of value as contributions to the theory of the origin of cancer, or the cause or contributory conditions primarily accountable for the disease. The wide distribution of cancer among civilized races, and particularly in well-settled communities or districts, early directed attention to the possibility of its being an infectious or contagious affliction of mankind. Countless papers have been contributed to the parasitic theory of cancer, but in the main the conclusions of even the foremost authorities on the subject must be considered unconvincing. The entire question of cancer as a contagious disease, its direct or indirect transmission from person to person, the extremely complex question of cancer à deux,‡ has been exhaustively dealt with by Wolff in the first volume of his treatise on cancer. Many citations are given of observations based largely on individual cases, tending to prove the parasitical theory, but in the main the data must be considered inconclusive. The statistical evidence in support of the theory, particularly in regard to the so-called cancer-houses, cancer-streets and cancer-villages, is also largely in the negative.

**Journal of the American Medical Association*, September 10, 1910.

†*Journal of the American Medical Association*, November 5, 1910.

‡J. Wolff, Die Lehre von der Krebskrankheit, Jena, 1907, Vol. i, pp. 519-710.

Charles P. Childe directs attention to the likeness of morbid new growths in human beings to some of the large parasitic tumors of plants and trees as tending to encourage the belief in the parasitic origin of cancer, but he considers most of these as wholly fantastical. He points out that "Pathologists all the world over have been hunting for the parasite, and so many parasites have been found, and no sooner found than found wanting, that a sense of disappointment has resulted, a sort of natural reaction has set in against this explanation of the origin of cancer." He, however, accepts the parasitic theory as perhaps better than any other in explaining some of its phenomena, but the evidence he advances is quite inconclusive. Charles Powell White, in his treatise on "The Pathology of Growth," holds that the increased proliferative capacity of the cells can not be ascribed to specific parasites, and that "It does not seem possible in any other way to explain tumor growths by the assumption of a specific causal parasite." According to this exceptionally careful observer, "It is impossible to account for the histiomata on this basis, and it is equally impossible to explain the complicated tumors, such as blastocytomata, teratomata and compound sarcomata." There only remain, therefore, "the sarcomata and carcinomata, and even in these cases the assumption of a specific parasitic origin leads to numerous difficulties." He enumerates three possibilities, as follows:

(*a*) There may be a single parasite for sarcoma and carcinoma. In this case it is impossible to explain the regularity with which metastatic tumors repeat the structure of the primary. We never find a primary carcinoma giving rise to secondary sarcomatous tumors as we should expect if both were due to the same causal parasite.

(*b*) There may be one parasite for sarcoma and another for carcinoma. Here again the similarity of the metastatic tumors to the primary provides an insuperable difficulty. If all forms of carcinoma were due to a single parasite we should expect that metastases in the liver, in some cases at least, would show the type of hepatic carcinoma: this does not occur.

(*c*) Each form of sarcoma and carcinoma may have its own specific parasite. Here we are at once met with the difficulty that the different forms of these tumors are almost innumerable, corresponding to the innumerable kinds of cells in the body. While they may be reduced to a limited number of type forms, yet there is no sharp boundary between the different groups, and there is a considerable variation within the limits of each group. We should have to suppose a different set of cancer parasites for each organ, and not only this, but we should have to assume a different series of parasites for each species of animal! The fact that tumors are found in all genera of the higher animals and have the same characters throughout, and yet it is impossible to graft a tumor from an animal of one species into another animal of a different species, while it is possible to do so within the same species, tells strongly against the theory of a parasitic origin.

Upon the basis of the foregoing observations he concludes that the assumption of a specific parasitic explanation leads to insuperable difficulties in explaining the observed phenomena. He adds, however, "These difficulties entirely disappear if we consider the cancer cell itself as a parasite and cancer as a process of infection by cancer cells." This conclusion, however, has not been generally accepted.

Topography and Cancer Occurrence

Frequent attempts have been made at precise correlation of local topography to exceptional cancer frequency, particularly in support of the parasitic theory of cancer origin. So-called cancer houses, alleys,

streets and villages are occasionally referred to in the literature of the subject, and in some cases the evidence, if not conclusive, is certainly not far from convincing that exceptional contributory conditions may exist, the nature of which has not yet been disclosed by the most scientific methods of research. Behla, in numerous contributions to German medical literature and the publications of the Imperial Health Department, has brought forward evidence to prove that a low-lying, swampy area favors an excessive frequency of cancer occurrence. At Luckau, for illustration, Behla found that in the low-lying suburban section cancer was nine times more common than in the higher or more elevated portions of the city. The suburban section was surrounded by much stagnant water, which, it is implied, acted as a medium for the conveyance of cancer parasites. The investigations of Behla are largely relied upon in support of the theory of cancer causation advanced by Green, who quotes from *Murphy's Surgery* an interesting reference to a cancer district in which it is claimed that cancer was exceptionally frequent in corner houses. On the basis of a survey as part of a special study of conditions in Scotland, Green concluded that the cancer death rate was invariably excessive in towns lying in a hollow, moderately high in towns on distinctly steep or hilly sites, and invariably below the average in towns on slopes and sites with comparatively flat surroundings. The highest death rate given by Green, 7.02, is for the town of Forfar, described as a town 200 feet above sea-level in a kind of basin formed by the surrounding slopes. Other towns with high death rates are referred to as located in a basin, or surrounded on all sides, or hemmed in by rising ground, or overlooked by an amphitheater of well-wooded hills, etc. The lowest rate given by Green, 1.75, is for the town of Kirkintilloch, described as being located in a low flat plain; and other towns with low rates are referred to as being surrounded by a wide tract of flat country, or nowhere more than a few feet above the level of the spring tides. The difficulty with investigations of this kind is that the influence of topography is most likely to be obscured by other factors of equal, or even more pronounced, influence in causing variations in the cancer death rate. A precise correlation of such conditions to the growth and dissemination of a specific parasite fails invariably on the ground that the common occurrence of cancer under fundamentally different conditions remains inexplicable. The theory advanced by Green is that the special statistics collected by him, with, it requires to be said, unusual caution and care, "prove that it must be some element in the environment of the sufferer which induces the disease, and if we admit this, we must admit an extrinsic origin." This conclusion does not necessarily follow; nor is this view at the present time accepted by any one of the leading authorities in the world on cancer causation. The view of Green, that "the longer one considers the question the stronger the presumption becomes that the cause is biochemical or parasitic" has, no doubt, some general evidence in its favor, but unfortunately the proof advanced has not stood the test of subsequent investigations, although it does not by any means follow that the parasitical nature of the disease may not be established in course of time. It is conceivable that with the further advance of biology, and particularly the minute study of animal and vegetable parasites, a micro-organism may be discovered

which conforms neither to the one nor to the other, though having in common some of the functions of each. It is also quite conceivable, in fact fairly well-established, that of the three distinct groups of plant parasites, as classified by Delafield and Prudden, "1, *Bacteria*, or fission fungi (Schizomycetes), 2, *Yeasts*, or yeast fungi, or sprouting fungi (Blastomycetes), 3, *Moulds*, or mould fungi (Hyphomycetes)," the second group, under given conditions, may assume characteristics or perform functions quite at variance with the first and with the last. The bacteria are, as is well known, of the greatest importance, because of the fact that they are very frequently the immediate causative factors in serious disease, the course of which differs fundamentally and in all essentials from the clinical pathology of cancer. The micro-organisms of the second group are larger than bacteria, and they are the direct causative factor in blastomycotic dermatitis, which is described as "a localized inflammation, papular and pustular in character, leading to warty outgrowths, to the formation of abscesses beneath the skin, and to ulcers." A generalization of the blastomycotic infection, under given conditions, may prove fatal. According to Delafield and Prudden, there are several forms of blastomycetes, but their classification is unsatisfactory. These references to biological consideration are sufficient to illustrate the very complex and ultrascientific character of the possible underlying and as yet undiscovered specific causative factors responsible for malignant tumor formation. The hypothesis, therefore, that cancer may be caused by micro-organisms entering the system from without is by no means unsupported by evidence entitled to scientific consideration. The difficulty lies in the practical application of the knowledge at present available to so extremely involved, widely varying, and apparently ever-illusive a problem as a high or a low degree of cancer frequency under apparently more or less identical external conditions.

Cancer-Houses

The practical importance of these studies lies in their application to the theory of cancer infection through some medium of contagion as yet undiscovered, but apparently met with in an exceptional degree of virulence in certain areas described as cancer-villages, cancer-streets, cancer-houses, and even cancer-rooms. Green cites such a house in the third edition of his statistical study of the cancer problem, which was located in his own district, and "which had ultimately to be pulled down owing to the great number of deaths from cancer which occurred in it." Wolff, in the third volume of his treatise on cancer, reviews the literature of the controversy, which has recently been revived by an extended discussion by Sir Thomas Oliver, of Newcastle-on-Tyne, and a counter statement by the Director of the Imperial Cancer Research Fund, in the Twelfth Annual Report of the Fund, issued under date of July 21, 1914. In brief, it would appear that the large majority of so-called cancer-houses were old, mouldy, damp, badly ventilated and otherwise unsanitary. Norwegian observers have called attention to the exceptional frequency of cancer in old farmhouses, and similar reports have been made for certain sections of Germany, including references to old rectories occupied by the clergy. In all such cases it is obvious

hat there would be, at least as a matter of frequent coincidence, a pre-ıonderance of aged persons of the cancer period living in the houses eferred to. Old, dilapidated, damp and neglected houses are usually he refuge of the aged poor, unwilling to go to almshouses or other ıstitutions for the aged. An old rectory or parsonage would generally e the home of a clergyman of the advanced cancer age. Old farm-ouses would be most likely to be used, if only for sentimental reasons, y the aged members of a family, of which the younger members had ıarried and gone to live elsewhere. In all of the cases referred to, here would be, in all probability, if but as a matter of coincidence, a ırger proportion of aged persons of the cancer period than in the popula-ion at large.

The controversial aspects of this question can not be reviewed here urther than by the following quotations from the Twelfth Annual Report of the Imperial Cancer Research Fund (1914), which contains n exceptionally valuable review of the literature of the subject and some ıstructive statistical calculations and observations which must be onsidered a most useful addition to our knowledge of this important hase of the cancer problem. It is said in the report referred to, in art, that "The term 'cancer-house' appears to have been introduced n 1892 by the late Dr. Law Webb, who was a general practitioner not laiming special knowledge of pathology or bacteriology, but who col-ected the cases occurring in his practice and wrote as follows: 'Dr. Haviland insists that a study of the Registrar-General's returns shows he existence of "cancer-fields" and "cancer areas" in this country, and hat soil and situation have much to do with the mortality from this lisease. I would go further and suggest that there are cancer-houses nd cancerous wells or water-supplies.' Dr. Webb left the question pen as to whether the 'noxious material is irritating chemically, or is a articulate body, such as a bacillus or a protozoon'; but those who have ollowed in his wake have adopted the infective hypothesis, and to quote Dr. Webb have maintained that 'the children of cancerous parents hen themselves past middle age, may contract the disease by pro-onged contact with the sufferer during the nursing of a lingering case r by handling and washing linen, etc., soiled with discharges. Again, oes this poison, or *materies morbi*, cling to, and infect certain localities ke the leprosy described in Leviticus?' Dr. Webb imagined the uestion he had raised was a perfectly simple one, 'A research demanding ıeither laboratory nor expensive instruments does not often present tself in these days; yet here is one.' The idea of its simplicity is still ncouraged, and the public is being misled by assertations as to the alue of enumerating houses in which one or more cases of cancer have ccurred. Such enumerations, if they are to have any value at all, ould only be preliminary to determining whether cancer was more requent in certain houses than was to be expected if cases of cancer were not derived by communication."

Pointing out that, on the basis of the returns of the Registrar-General for 1911, the chance that a man over 35 years of age will die of cancer is one in 9.7, and the chance for a woman above the same age is one in 7.4, the following table is introduced as tending to show how

often on the basis of these proportions no death, or one, two, three, etc., deaths from cancer may be expected to be recorded in 100 families, half the members of which are men and half women, and in which no hereditary tendency or infection is assumed, and in which all persons dying under 35 are excluded:

Table Showing the Probability of Multiple Cancer Cases in Groups of Persons of the Numbers Stated Without Assuming Hereditary Tendency or Infection

Number of Cancer Deaths in Family	Per 100 Families of 6 Members, viz. 3 Men, 3 Women	Per 100 Families of 8 Members, viz. 4 Men, 4 Women	Per 100 Families of 10 Members, viz. 5 Men, 5 Women
None	47	36	28
One	38	39	38
Two	13	19	23
Three or more	2	6	11
	100	100	100

It is properly pointed out in this connection that the determination as to whether cancer is more frequent in certain houses than in others is much more complex than the simple arithmetic of enumeration. These words of caution can not easily be overemphasized, since a large number of factors and conditioning circumstances require to be known and reduced to measurable and comparable proportions. Dr. Bashford submits a fairly complete analysis of five of the best known instances of cancer-houses, based upon special studies and visits to the places reported upon. The results conclusively prove at the outset that some of the fundamental requirements of statistical inquiry were ignored and that in the main the conclusions throughout were made to rest upon an inadequate numerical basis of fact. Numerous actual and serious errors in the original statements were discovered, and subjecting the data to correction, quite different conclusions were reached. These errors included misstatements in age, occupation, alleged site and the certified causes of death. Without enlarging upon the details of the investigation, which appears to have been made with exceptional thoroughness, and the complete results of which, it is intimated, will be published in due course, the results are summarized in the statement that "'Cancer-houses' are as much a myth as are 'cancer-cages' [in connection with experiments on animals]. The advantage of the experimental method is clearly brought out when it is recalled that 73, 33, 26, and 20 years of observation on man have only led to inconclusive and, according to present knowledge, quite erroneous results. . . . Some of the interest attaching to 'Cancer Houses' and 'Cancer Villages,' not only for laymen but also for some members of the medical profession, is due to the mystery that is made of them—the places go unnamed." A special reference is made to the case of Ayr, in Scotland, where upon subjecting the facts to qualified analysis it was found that the predominating contributory condition to the excessive cancer death rate was the great preponderance of elderly people in the populations considered. The discussion having been originally raised by Mr. D'Arcy Powers in 1898 and 1903, the new facts were brought to his knowledge,

and he agreed with the explanation provided by the additional data. The hope is therefore expressed by the Director of the Imperial Cancer Research Fund that "the dangers of 'cancer-houses' will cease alike to alarm the public and to divert the energies of investigators from fruitful lines of inquiry."

In commenting upon the observations by Sir Thomas Oliver with reference to the same subject, *The Lancet*, in an editorial discussion of "Cancer-Houses," remarks: "Conviction before the tribunal of public opinion is liable to be obtained by looser and easier methods than before a court jealous to observe and trained to apply the laws of scientific evidence. The difficulty is to obtain a series of houses in which the requisite series of cases of cancer can be found to have occurred, and to eliminate from those cases the possibility of their having been due as much to hereditary tendencies, which in the sifting of evidence cannot be ruled out, or to industries causing a predisposition to cancer, or to other influences. That successive cases of cancer should appear in a single house or in a group of houses is not in itself surprising, for it is not a rare disease, population has increased, and there are crowded areas and houses in which many persons will be found who are of the age with which the development of cancer is associated, so that the element of coincidence is not easy to eliminate. Unfortunately, the romantic mind never will try to eliminate it; the romantic mind revels in the trouble caused by coincidence."

Cancer-Villages

Strictly localized intensive cancer studies would unquestionably add much material of great value to the cause of cancer research. Regardless of the inconclusive character of practically all the observations on so-called "cancer-houses," "cancer-streets" and "cancer-villages," the fact is incontrovertible that an enormous range in cancer frequency is met with throughout the world, and that as yet no generally acceptable theory in explanation of such a wide degree of divergence has been advanced. An auspicious beginning in the direction of the study of areas of excessive cancer frequency in the state of New York was made by Lyon in behalf of the New York State Institute for the Study of Malignant Disease. Lyon found an area comprising some 75 square miles in Brookfield Township, Madison County, New York, in which among a relatively small population excessive cancer rates had prevailed for a period of years. Unfortunately, the investigations were discontinued, but as shown in my address on the *Menace of Cancer*, the rate of cancer frequency in this section of Madison County has remained excessive to the present time. It is suggestive that this observer found Brookfield a poor rural community, in which a livelihood was obtained with difficulty. The average age at death was 54.4 years, which would indicate a rather high proportion of population of the cancer age; but after making allowance for the age factor, the local cancer death rate was still found to be excessive. After discounting the factor of longevity and errors in diagnosis, Lyon concludes that heredity and consanguinity are the special factors that have operated with peculiar force in Brookfield to produce the high cancer mortality over that attributable to the factors already

considered. He is careful to point out that the acceptance of the factor of heredity does not necessarily commit one against the parasitic theory. The evidence concerning cancer-houses, as such, was rather negative, and cancer foci were not found to exist, "unless the houses with multiple cases could be so regarded." Four instances of cancer in husband and wife were found. In the main, the data are inconclusive. Only 84 deaths were considered, and of this number 33 were due to cancer of the stomach, 10 to cancer of the uterus and 8 to cancer of the breast. The deaths were not calculated on the basis of the population exposed to the risk of cancer according to age, but the proportionate method was used, which for the present purpose, particularly in view of the small number of cases considered, must be rejected as inadequate. The final conclusion of Lyon that the district investigated "represents a concentration of cancer families rather than cancer-houses," is also debatable, if carried to the point of providing support for the theory of hereditary disease transmission. It is extremely regrettable that these investigations should not have been carried further, and that the available data should not have been subjected to a more critical and qualified analysis.

It would hardly serve a practical purpose to review in further detail the numerous special investigations of alleged cancer-houses or cancer-districts. The motive of such studies to establish a preconceived theory of infection or contagion discounts the scientific value of the conclusions advanced. Lazarus-Barlow is referred to* as having put forward the rather novel theory that the presence of some radio-active substance in the building material, or even in the soil upon which such (cancer) houses were erected might account for the higher frequency of the disease in some localities or particular groups of houses than in others. The interesting statement is made in this connection that this point of view did not "necessarily conflict with Cohnheim's theory of embryonic rests or with Virchow's theory of mechanical irritation or with Adami's theory of habit of growth, since radioactivity in the causative agent or in the tissues might be the underlying force in each. Even the microbic theory might be reconciled with this idea, for it is supposable that the assumed bacterial or protozoan agent in such case might be radioactive." The evidence advanced, however, can not be considered final, but, as observed in the discussion referred to, "Nevertheless this work, inconclusive as it is in its results, is deserving of careful study and extension. . . . Further investigations along this line may indeed explain away discrepancies now precluding an acceptance of the theory of infection, but even should they fail to do so, work of this kind is never fruitless and it may prove to have an important bearing on other biological problems, even if it does not explain the origin of cancer."

Evidence of Parasitical Origin Not Conclusive

Briefly reviewing some of the most important contributions to the study of the possible parasitical origin of cancer, mention may be made of the following: Hoeber has reported for Augsburg, Germany,† the results of an extended investigation, presented in a number of tables

*Medical Record, New York, August 7, 1909.

†Zeitschrift für Krebsforschung, Jena, 1904, Vol. i, p. 173.

ıd maps, showing the cancer-houses, the soil and geological foundation, c., and the coincidence of tuberculosis, but he was unable to discover ıy connection between the occurrence of cancer and the height, drainage ıd other conditions of the houses. He found that both cancer and .berculosis were most prevalent in the poorer quarters.* In the hames Valley, the statistics of all the counties indicate a cancer death te above the average for England as a whole. "The statistics em to justify the conclusion that this section has a relatively high ortality from cancer and the uniformly high rate on both of the banks ggests that there may be a connection between the river floods and the tent of the disease," which, however, is not explained on the assumption a parasitical origin of the disease. These studies suggest that the ying vegetation on the river-banks may be a favorable nidus for the owth of the parasite, but this would not explain the increase of cancer, hich seems everywhere apparent.†

It has been pointed out in this connection, in the *Journal of the merican Medical Association*, March 25, 1905, commenting upon cent contributions to the literature of cancer parasites by Robertson ıd Wade, following Behla and Gaylord, that "The fallacy of the cancer ›use theory, however, has been proved by the careful work of Lyon, ho has shown that house collections of cases are far better explained ᵧ the influence of heredity and an in-and-in breeding than by infecon." Referring to the investigations of Dr. Munch Soegaard of Norway, ıe *British Medical Journal* of December 24, 1910, remarks that

Since the total number of cases with which he deals is so small, and the possibilities of ror are so large, it is unnecessary to follow up his cases any further in respect to inherince. We may, therefore, register the verdict with regard to this account as "not proven." e calls the cottages in which some of the patients lived and died "Krebshöfen," or cancer ttages. His observations lead him to summarize that in 18 out of 68 cases the cancer tient had lived in intimate contact with another cancer patient. The cottages or löfe" are described in vivid colors, and certainly appear to be veritable insanitary nests, which infection might readily occur. But where overcrowding and other evils are und, it must be assumed that other factors of a deteriorating type must also prevail, d the mere occurrence of cancer in several persons living in these hovels does not prove fection. In the same way, when he tries to prove infection by citing the experience that ose persons who left the neighborhood to live elsewhere escaped from the ravages of e terrible malady, while those who remained at home were more or less attacked, it ust be emphasized that other factors have to be taken into consideration, of which the ode of feeding, the habits with regard to irritation and local stimulation, may be inınced. Again, it is inconceivable that one infection should at times produce carcinoma, ıd at other times sarcoma, and at still others rodent ulcer. Dr. Soegaard records cases all three arising in one and the same environment.

The cancer census of Baden is briefly referred to in the *Journal of ıe American Medical Association* for October 12, 1911, as follows:

Werner's exhaustive study of conditions in the state of Baden in regard to the occurrnce of cancer, seems to show that external factors, physical, chemical or parasitic, comletely overshadow in importance the biologic-hereditary factors. In the cases of conıgal cancer, the organs involved excluded direct contact as the growths were generally ı the stomach, and never on the skin, lip or genital organs. Contact infection is renered improbable further by his figures showing that cancer is least prevalent in the redominantly industrial communities. It seems to occur according to laws which have een seen to prevail in the occurrence of the non-contagious infectious diseases connected rith local conditions. This fact affords new evidence as to a possible parasitic origin of

*Journal of the American Medical Association, March 26, 1904.
†Journal of the American Medical Association, April 30, 1904.

cancer. An inherited predisposition is not the prominent factor previously assumed or the influence of heredity would have been more apparent in the data he has collected. In some of the districts the number of cases is steadily decreasing, in others increasing; twelve communities were entirely free and 1,001 had much less than the general average, while 575 had much above the average, but no common geologic, hydrographic, climatic or architectural factors could be detected as responsible for this frequency or scarcity of cancer, nor age, sex, social standing, race, occupation or diet, nor distribution of the fauna and flora of the district. Werner's recent more detailed study of twenty-seven of the places where cancer is most prevalent and forty-six where it is least so has demonstrated anew that the difference in prevalence of cancer cannot be explained by the difference in the proportion of elderly persons, but seems to be connected in some way with the place.

In the same discussion the conclusion is advanced with reference to cancer frequency among blood relations and cancer-houses that

These data completely disprove the assumption of cancer families, but add new support to the assumption of cancer houses and neighborhoods.

Sir George Beatson in a discussion of the cancer statistics of Scotland for the period 1861-1900, read before the Royal Society of Edinburgh, brought forward some rather interesting views on the cancer problem, briefly summarized in the statement that:

Cancer as a disease occurs not in the decline of life but on the cessation of reproductive life. Climate and geological conditions do not affect the question. Whether so-called "cancer homes" are instances of coincidence or not is not settled. The only preventive measure which suggests itself as of any value is *notification* which would give more accurate information as to where the disease arises.*

Pöppelmann is authority for the statement, based, however, upon only 85 cases of cancer in a town of 8,000 inhabitants, that "the results show that the houses which stood nearest to water courses, and especially to stagnant water, showed much the larger proportion of cancer cases. The principal focus proved to be the region from the backwater from a dam." He urges the compilation of statistics, with maps, of small towns, where conditions are better known than in cities, with a special regard, however, to the location of cancer deaths in houses near brooks, rivers and dams.

From quite another point of view the subject has been approached by Wilfred Watkins-Pitchford, Government Pathologist of Natal, in a paper on Light, Pigmentation and New Growth,† who points out that "Cancer has been found to be slightly more prevalent among those who are the more exposed to actinic stimulation—seamen, dwellers beside lakes and rivers, agricultural laborers, etc., etc.," and "Cancer houses usually appear to be unwholesome dwellings, often affording special facilities in their immediate neighborhood for the irradiation of their anemic inhabitants."

Commenting upon the local incidence of cancer in New Zealand, Hislop and Fenwick,‡ after referring to the investigations of D'Arcy Power conclude that "The neighborhood of the native bush and bush streams seems to have some distinct connection in the origin of the disease. Malaria may not be antagonistic to cancer, but it is significant that where malaria is common cancer appears to be rare. It may not be improbable that there is some malarial poison antagonistic to the growth of cancer

***Medical Record*, New York, July 6, 1912.

†*British Medical Journal*, August 21, 1909.

‡*British Medical Journal*, October 23, 1909.

cells. So many of the cases were rheumatic, and rheumatism is so prevalent in subacute or chronic forms in bush districts, that we can hardly ascribe the coincidence of cancer and rheumatism to an accident. It is not impossible to imagine that the circulation of the blood in rheumatic cases may act as a direct irritant to the tissues." In the case of most of these investigations the facts relied upon are, as a rule, entirely inadequate for the purpose of establishing a scientific theory of cancer correlation to local conditions more or less superficially described. The evidence regarding specific cancer-carriers has not been forthcoming, although at the second International Cancer Conference* Dr. Borrel gave an account of his views on "the possibility of cestodes and *Demodex* fulfilling the part of intermediate hosts or carriers of a hypothetical cancer virus." This view has been vigorously criticized and has not been generally accepted.

Equally inconclusive were the results of a special study by Dr. George D. White of five cases of cancer with four deaths in a certain district of Jersey City, particularly for the purpose of proving the possibility of contagion or the parasitical or bacteriological factor in the propagation of malignant disease.

It has seemed necessary to review at some length the salient points of a controversy of long standing in view of the practical importance of the question whether cancer frequency can be precisely correlated to specific determinable local factors or conditions. In view of the truly enormous frequency of cancer, it would seem a foregone conclusion that if such a correlation existed, it would not be difficult to provide the necessary indisputable evidence. The proof, as far as can be gathered from a careful reconsideration of the published evidence, is, therefore, opposed to the theory of the parasitical origin of malignant disease and its spread by personal contact or by transmission from person to person by some carrier at present unknown.†

Cancer à Deux or Infection of Husband and Wife

Closely allied, in fact interminably interwoven with the theory of cancer-houses, is the theory of cancer infection of husband and wife. There are, no doubt, cases of coincident cancer occurrence in husband and wife, and in a very few of these cases the form of cancer in both has been the same. Weinberg found that in Stuttgart, during the period 1873-1902, of the widowers and widows dying of cancer, the frequency

**British Medical Journal*, October 22, 1910.

†The following is a suggestive reference to the relation of cancer to locality, by W. S. Lazarus-Barlow, in his third lecture on Radio-Activity and Carcinoma (*British Medical Journal*, June 26, 1909): "On the other hand, it [the theory of the radio-activity of scotographic materials] would not be opposed to a belief in 'cancer houses and localities,' for there is no reason why the soils of districts or the materials of which houses are built should not differ in the degree to which they are radio-active, nor why the local radio-activity should not be in certain instances so considerable that cancer arises in successive inhabitants time after time. In a sense the electrical department of every hospital is a 'cancer house.' It would not be opposed either to an infective or non-infective, a contagious or non-contagious, an animal or vegetable parasitic, a parasitic or non-parasitic, a hereditary or non-hereditary view of cancer, for it would only be concerned with the question whether the inculpated agent is radio-active or not. So far as certain bacteria possessed the properties we are considering, the carcinoma associated with them might be regarded as bacterial and infective, but the bacterial and infective properties would be accidental and non-essential. So far as the agent which leads to hereditary transmission was provided with 'radio-active' properties cancer would be hereditary, but the inheritance of cancer would be accidental and non-essential. Similarly it would not be opposed to Cohnheim's theory of embryonic rests, to Virchow's theory of mechanical irritation, to von Hansemann's theory of anaplasia, to Ribbert's theory of tissue tension, to Adami's theory of habit of growth—for it would constitute the underlying force required by each."

rate in proportion to the population was not above the average. Frief of Breslau determined the number of cancer cases among surviving husbands and wives, but the mortality was not abnormal. Smith of Santa Clara, California, in 1895 reported the case of a woman 68 years of age whose death from cancer of the breast was, six months later, followed by the occurrence of cancer of the stomach and liver in her husband. Such cases, however, are apparently merely a matter of coincidence or pure chance. If cancer were in any appreciable number of cases transmitted from husband to wife, or *vice versa*, the number of recorded cases should be very large, in view of the general frequency of the disease after forty. The precarious nature of the statistical data on the subject is best illustrated in the results of the Baden Cancer Census, according to which the suspicion of direct cancer transmission from person to person was indicated in the returns for 1904 in the proportion of 4.8 per cent. and in the returns for 1906 in the proportion of 10.7 per cent. of all the cancer cases under observation.*

The same question was considered in the Hungarian cancer census from the point of view of direct contact, of living together in the same house and of contact with cancerous animals, but the results were inconclusive. Only two cases were recorded in which there might possibly have been cancer infection as a result of marital relations, but such statistical evidence unsupported by additional details derived from medical sources can not be considered conclusive. It has been observed in this connection by W. Roger Williams that "If cancer could be proved to be an inoculable contagious malady, the question as to its causation would be greatly simplified, in favor of extrinsic factors; but, so far as we have hitherto examined this question, no reliable evidence of contagion has been forthcoming." Referring to his eight years' experience at the Middlesex Hospital, he adds that he had never noticed "a single fact that could possibly be construed as evidence of the communicability of malignant disease from one human being to another," but to the contrary, he noticed "many indications which seemed clearly to imply, that the disease was neither infectious nor contagious." He reviews the evidence published from time to time regarding the recorded cases of transmission of cancer from one human being to another, but he concludes that "the evidence adduced as to contagion in these cases is of such a flimsy and obviously unreliable nature as to absolve me from the necessity of detailed refutation."

No Surgical Infection in Cancer Operations

If cancer were contagious, infectious, or, in other words, transmissible from one person to another, it would naturally be expected that surgeons employed in cancer operations would, at least occasionally, fall a victim to the malady in the course of their occupation. Cases of surgical infection are by no means uncommon in the case of many infectious or contagious diseases, but there is not a trustworthy recorded case of a surgeon having acquired the disease in the course of contact

*The identical question is raised in discussions of the relative frequency of tuberculosis in husband and wife. The matter has been thoroughly considered by Longstaff in his "Studies in Statistics," in a chapter on a Calculation of the Probability of the Accidental and Fatal Incidence of Phthisis upon Both Husband and Wife, London, 1891, p. 384. The negative conclusions arrived at apply with equal force to the theoretical probability of cancer infection of husband and wife.

in consequence of surgical operations for cancer. Dr. George W. Crile, in his oration on Surgery at the Fifty-ninth Annual Session of the American Medical Association, after reviewing the few spontaneous cancers that have been successfully transplanted from one animal to another of the same species and after mentioning the fact that no cancer has as yet been successfully transplanted from one animal species to another species, points out that the surgeon's immunity from cancer infection during cancer operations is practically complete. Dr. Willy Meyer, in an address before the Cancer Research Institute,* in reply to the question as to whether cancer was infectious or contagious, or both, observes that, "One had never seen nor heard of a patient afflicted with the disease conveying it to his wife. Nor had they ever heard of a nurse caring for a patient with carcinoma for months ever becoming stricken with the disease. Nor had he ever heard of a surgeon who, for instance, had injured his finger during the performance of some operation on a cancerous subject ever developing cancer. It did therefore not appear that cancer could be conveyed from one person to another in this way, and therefore the disease could not be considered infectious."

Dr. J. W. Vaughan, in an address on "Some Modern Ideas of Cancer,"† concludes, in regard to contact tumors and direct infection, that "Surgeons have been removing cancers since the time of Hippocrates, and as yet no case of infection from such a source has ever been observed." Rodman, in an address on cancer read in the section on Surgery and Anatomy of the American Medical Association, at the Fifty-sixth Annual Session, remarks that "The rarity of, if not unheard of, infection of operating surgeons by cancerous patients is the strongest possible evidence against the parasitic nature of the disease."‡ It would serve no purpose to add to the foregoing the available additional evidence from other sources in support of the contention that in the light of our present knowledge cancer is not an infectious or contagious, or, in other words, a transmissible disease from person to person by contact, or by other means of germ conveyance. If future researches along the line of the admirable work of Roncali into the minute study of the blastomycetes should prove successful, and establish the parasitical origin of cancer, it will no doubt be found that the nature of the organism varies fundamentally and essentially from the animal or vegetable parasites responsible for the transmission of the so-called contagious or infectious diseases best typified by typhoid, smallpox and diphtheria.

Cancer Not Caused by Worry

The public agitation of the cancer problem has aroused opposition on the part of those apprehensive that those predisposed to the disease or actually suffering therefrom may be unduly alarmed, and that those practically free therefrom may be mentally disturbed to the point of hysteria or cancerphobia. The evidence at present available and briefly restated in the preceding discussion should allay the reasonable anxiety

*_Medical Record_, October 11, 1913.
†_Journal of the American Medical Association_, May 7, 1910.
‡_Journal of the American Medical Association_, September 30, 1905.

on the part of the public, first, in regard to the possible heredity of cancer, and second, in regard to the remotely possible but not probable transmission of the disease by personal contact or in some more subtle and less readily determinable way. To this may be added the assurance that cancer is not caused by worry, any more than smallpox or yellow fever. Worry has been defined as "the restless consciousness of all encumbrances which we accept under protest." "The fact, however, cannot be too strongly emphasized," in the words of Dr. E. D. Forrest, "that the primary mental condition is one of overactivity, and moreover, overactivity along lines of fixed ideas." According to the same authority, the physical manifestations of worry in general are "depression of respiration, sighing, disturbances in rate and force of heart beat, vasomotor changes, disturbances in secretion, pallor, cold extremities, relaxation and decreased motility of the alimentary tract, dilatation of the pupil, loss of weight, insomnia and general physical exhaustion." Considered from this point of view, it is held that worry may sometimes be an important contributory factor in the production of diabetes, gout, exophthalmic goitre and chronic heart disease. It might seem a reasonable inference that under these conditions worry might also be a contributory factor in cancer, but this conclusion does not necessarily follow. Disturbances in secretion, no doubt, might lead to local irritation and thus further the development of precancerous conditions arising out of errors in nutrition; but there probably would have been cancer without worry, as it is conceivable that the disease would have been assisted in its development by mental overactivity along lines of fixed ideas.

Cancer and Insanity

This question has been quite fully discussed by Römer, of Stuttgart, in a contribution to the "Journal of the German Cancer Society" (1906). Groundless fear of cancer as a cause of insanity is referred to by Römer as having been observed in rare individual cases, but the same argument would apply against countless other factors of suggestion more or less conceivable as contributory causes of mental disease. Römer objects to the public agitation of the cancer problem, particularly on the ground of cancer increase, which, he maintains, has not been proved, nor even made evident as a question of abstract probability. He directs attention to the fear of inheritance in cancer as a predisposing cause of insanity, even though this apprehension is well known to be practically without trustworthy evidence. He also apprehends serious results from a spreading conviction that cancer is a contagious or transmissible disease, but he fails to furnish the necessary statistical evidence that cancer fear or cancer apprehension is taken note of to an appreciable extent as a contributory condition in the admissions to asylums for the insane.* He concedes the great importance of cancer education as a first step towards the possible public control of the disease on the basis of a rational understanding regarding the supreme importance of qualified attention,

*Cancer worry or cancer fear is not referred to as a predisposing cause of insanity by Bernard Hollander in his treatise on "The First Signs of Insanity," nor by T. S. Clouston in his work on "Unsoundness of Mind." Other diseases, such as influenza, circulatory disturbances, even child-bearing, exhaustion and fatigue, are mentioned, but there is no reference to cancer or to tumors of the non-malignant type. Charles Mercier, in his treatise on "Sanity and Insanity," and Henry Maudsley, in his work on "Responsibility in Mental Disease," do not mention cancer as a contributory factor in insanity.

medical or surgical, on the recognition of the earliest symptoms. The danger of encouraging persons needlessly alarmed about cancer to seek the advice of alleged cancer specialists or to place faith in alleged cancer cures, with the increased certainty of fatal results, is well to the point, and deserving of serious thought. He argues that in the main the educational efforts should be through the medium of the family physician of the patient, but the difficulty in this respect is a practical one, in that the vast majority of cancer patients have not the least conception of the extreme seriousness of the earliest symptoms and therefore do not seek the advice of even the family physician until the cancerous growth has reached a stage where the disease has practically extended more or less to the adjoining glands or parts and thus reached a more or less inoperable stage. Römer concludes that the problem is largely one of increased cooperation between physicians and surgeons, on the one hand, and a more perfect mutual understanding and confidence between patient and physician, on the other. The enormous mortality from cancer throughout the world and the obvious increase in the rate of cancer frequency bear witness to the fact that no progress towards cancer mortality control is likely to be made along these very general and rather superficial lines of an understanding on the part of the profession and the public of the menace and the urgency of the earliest practicable removal of the offending cancerous growth.

Radium and Radiotherapy

A thoroughly qualified statistical inquiry into the results of cancer treatment would make an extremely valuable contribution to the cause of cancer research. A large amount of statistical information has been published on the results of surgical operations, but the methods of statistical analysis have, as a rule, been crude and often not free from serious technical objections. In the case of the non-surgical treatment of cancer the statistical considerations are even more involved, and the conclusions advanced are less to be relied upon as impartial and accurate. The underlying reason is to be found in the widely varying and statistically ill-defined principles of medical and surgical practice; in other words, it is extremely difficult, if not practically impossible, to reduce the cases considered to an absolutely comparable basis. For illustration, one institution may treat largely inoperable cases, as a matter of charity or positive necessity; another institution may treat only such cases as upon thorough examination warrant an exceptionally favorable prognosis; yet the first of the two might actually be better adminstered and yield relatively more favorable results than the second. It is therefore obvious that statistical conclusions regarding methods of treatment require to be accepted with extreme caution.

These observations apply with special force to radiotherapy as a possible solution of the apparently hopeless problem of an effective cancer cure by other means than radical surgical interference The subject of radium, however, has attracted so much attention within the last few years that it has seemed advisable to include a brief discussion of it, regardless of the rather doubtful value of the statistical evidence available at the present time. The opinion has been expressed by

Mr. A. E. Hayward Pinch, the medical superintendent of the Radium Institute of London, that "No useful purpose would be served by a minute analysis of the statistics," for, as observed by the *British Medical Journal*, "the stages and extent of the disease vary so much from case to case that only a very large number would warrant the use of the statistical method." Subsequently, however, some very interesting statistics have been published by the Institute, which will presently be discussed in some detail. It requires to be kept in mind that the modern surgical treatment of cancer is unquestionably much more effective than the surgical practice of the past and that the results obtained are in almost precise relation to the previous duration of the disease, or, in other words, to the attained size and degree of infiltration of the cancerous mass into the adjacent tissue through the regional lymphatic glands. The average surgical results, under normal conditions, have been summarized by Dr. Isaac Levin, in the following statement:

Only in *carcinoma of the lip* the radical cure by the aid of the so-called block dissection of the tumor and the regional lymph glands is as high as 70 to 83 per cent. In *carcinoma of the breast* Halstead, who is one of the best operators of this condition, reports that 38.8 per cent. of the cases which were operated remained well for three years and over. Since not all the cases examined were operable, probably not more than 30 per cent. of the cases of carcinoma of the breast can be cured by surgery alone. In regard to *carcinoma of the uterus* Wertheim, the greatest authority on the surgical treatment of this condition, states that about one half of the cases which come to him are operable and of these about one-half are cured by the operation, consequently about 25 per cent. of the cases of carcinoma of the uterus may be cured by operative treatment. Wm. J. Mayo, who is one of the most brilliant operators in the world, reported recently on 996 cases of *carcinoma of the stomach*. Of these 344 cases only were operable and of the latter 25 per cent. remained cured five years and over after the operation. In other words, about 9 per cent. of cases of carcinoma of the stomach can be cured by surgery alone in the hands of a Mayo and probably an even smaller percentage in the hands of most other surgeons. In all rather less than 30 per cent. of cancer patients can hope to be cured by the aid of surgery alone.*

It must be admitted that these results are disappointing, considering the high degree of surgical efficiency on the part of those who are rightfully considered the master minds of the surgical profession, but Dr. Levin is far from being justified in his conclusion that "It is also safe to assume that there can hardly be expected any further progress in surgical treatment of malignant tumors," for the self-evident reason that in the past the large majority of the cancer patients obtained surgical treatment at a time when the cancerous growth had probably reached the inoperable stage. These observations seem called for in view of the reasons advanced in behalf of the radium treatment as a substitute for surgical interference, even though evidence is wanting to prove that radiotherapy would be applicable to the large majority of deep-seated cancers, which cause the major portion of the aggregate mortality from malignant disease.

Radiotherapy is a branch of physiotherapy, which includes treatment by heat, light, electricity and radio-activity. A brief outline of the principles of physiotherapy in its relation to cancer is contained in the treatise on "The Cancer Problem," by William Seaman Bainbridge, who refers to the discovery of Roentgen rays in 1895, which were also

*Isaac Levin, "The Relation Between the Surgical Treatment and Radiotherapy of Cancer," *Medical Record*, October 10, 1914.

first employed in the treatment of malignant disease. Elsewhere in this work reference has been made to X-ray dermatitis, or skin cancer, due to the action of the rays, met with among Roentgen-ray workers. In moderate forms of cancer, however, the application of X-rays has been beneficial in treatment, but the statistical data are far from sufficient and conclusive. The discovery of radium and radio-activity by Mme. Curie dates from 1898-1900. The general principles of radiotherapy have been elaborately set forth in a work by Wickham and Degrais, translated by Dore, with an introduction by Sir Malcolm Morris. The therapeutic results discussed in the work are illustrated by a large number of colored photographs of cases before and after treatment. Most of these cases represent external or superficial cancers, and but a few are derived from gynecological experience. In a subsequent treatise on radium, as employed in the treatment of cancer, angiomata, keloids, etc., the same authors present much additional evidence, but again most of the illustrations are of superficial cutaneous cancers, which would naturally be most likely to yield satisfactory results.

The statistical interpretation of the facts presented by these and other authors on radiotherapy is as yet far from convincing. The first annual report of the Radium Institute, published in the *British Medical Journal*, under date of January 25, 1913, includes 657 cases, but of these a large number were not malignant disease. Of the carcinomata and sarcomata not a single case was reported as cured; but out of 447 cases treated, 44, or 9.8 per cent., were reported as apparently cured; 137, or 30.6 per cent., as improved; and 52, or 11.6 per cent., as having died.

According to the annual report of the London Radium Institute for 1913, 972 cases were treated during the year, of which 548 were cases of malignant disease. Of this number 1 was reported as cured, but 50, or 9.1 per cent., were reported as apparently cured; 181, or 33 per cent., as improved; and 37, or 6.8 per cent., as having died.

A review of the recorded observations on individual cases warrants the conclusion that radium is unquestionably an effective method of treatment in superficial cancers, particularly in the earlier stages of the disease. The results of the treatment, however, are largely dependent upon the quantity of radium used. Failures are more likely to be attributable to the insufficiency in the amount of radium available than to any other cause, at least in patients in a far-advanced stage of the disease. These conclusions, however, apply, as yet, almost exclusively to superficial cutaneous cancers, which cause but a small fraction of the aggregate annual loss of life. There has not been sufficient time to observe the after-effects of radium treatment in a large enough number of typical cases. The statistical experience data have also not as yet been subjected to an extended critical analysis, with a due regard to the organs and parts of the body affected or the specific types of the disease and the degree of cancerous involvement. Nor has the question of joint results in operative and radium treatment combined received adequate attention. There would seem to be much ground for accepting the conclusion that the best results, at least in internal cancers, are likely to be obtained, first, by surgical interference, and, second, by subsequent radiotherapy.

The practical question remains, however, as to where, under present conditions the required amount of radium is to be obtained, and the outlook is far from encouraging that within a measurable period of time there will be sufficient radium for proper treatment, even in the principal centers of population. The hope for the future lies in the efforts now being made by the United States Bureau of Mines to develop the carnotite deposits of Colorado and Utah, which, it is to be hoped, may yield a sufficient supply for general use.*

Need of an Educational Propaganda

Within the last few years the conviction has been gaining ground that the cancer problem is in a large measure a public question of increasing importance. As early as 1891, and possibly before, Dr. G. Winter of Königsberg, initiated a public campaign for the education of the general practitioner and the laity in the important question of the earliest possible recognition of symptoms, diagnosis and qualified treatment of cancer of the uterus. The principles of a public campaign as laid down by Winter have become generally adopted in similar efforts inaugurated in other countries, not only in regard to cancer of the uterus, but in behalf of a movement for the control of cancer in any and all of its multitudinous varieties. The cardinal principles advanced by Winter are, in brief, (1) the ignorance or indifference of the average practitioner regarding the seriousness of the first symptoms of malignant disease, (2) the ignorance and even criminal carelessness of midwives, (3) the criminal practices of charlatans in advertising cancer cures;† and (4) the ignorance of the laity.

A full discussion of the development of the educational campaign would carry the present work far beyond the original plan and scope of a concise presentation and review of the available statistical data regarding cancer frequency throughout the world. The primary purpose being a collection of trustworthy statistical data essential to the furtherance of efforts to educate the general practitioner and the general public in the fundamental facts of the cancer problem. It has, however, seemed appropriate to include the following brief outline of what has thus far been done in carrying out a program of far-reaching significance, not only to the medical profession, but, in fact, to the adult population of every civilized country in the world.

Importance of Knowledge of Early Symptoms of Cancer

Suggestions regarding the advantages of a better understanding on the part of the general public of the essential facts of the cancer problem

*The statistics of the London Radium Institute for 1914 are derived from the abstract printed in the November 14, 1914, issue of the *Scientific American Supplement*. The abstract of the report itself is to be found in the *British Medical Journal*, February 27, 1914. The results of the Radium Investigations of the Bureau of Mines are contained in Bulletin No. 70 of the series of reports on Mineral Technology, published under the direction of Charles L. Parsons, Washington, 1913. The Hearings on Radium before the Committee on Mines and Mining, held on Joint Resolution 185-186, were published as a Congressional document, Washington, 1914. The report of the Committee was issued under date of February 3, 1914, and is published as Report No. 214, House of Representatives, 63d Congress, 2d Session.

†Misleading advertisements of alleged cancer remedies and cancer cures are unquestionably the means of a vast amount of injury to the public. In Great Britain the subject of cancer advertisements was investigated by the House of Commons, through a Select Committee on Patent Medicines. The committee made its report under date of August 4, 1914, and recommended, with other instructions, "that the advertisement and sale (except the sale by a doctor's order) of medicines purporting to cure the following diseases be prohibited: *cancer*, consumption, deafness, diabetes, epilepsy, etc."

have been made from time to time, but the classical effort in this direction is the work of Dr. Georg Winter, who, as early as 1891, initiated a public campaign against cancer of the uterus in East Prussia. In an address read before the Mississippi Valley Medical Association in 1895, Dr. Theodore A. McGraw, after pointing out that a society called "The League Against Cancer" had recently been formed in France with the object of instituting a crusade against malignant disease, concluded with the suggestion that "Physicians should be better instructed in the means of diagnosis and in the necessity of early operative treatment, and last, but not least, the laity should be induced to assist not only with liberal contributions of means, but also with that intelligent cooperation which would lessen our difficulties in collecting evidence and making post-mortems and keeping the sufferers out of the hands of quacks." Five years later, Dr. Philander A. Harris, in a brief address before the New York Academy of Medicine, gave expression to the view that "The profession should be educated, and secondarily the people should become educated, as to the importance of early operation." Dr. W. L. Rodman of Philadelphia, in a paper read in the Section on Surgery and Anatomy of the American Medical Association, July, 1905, suggested that "the public be educated, as they will be in time, to believe that an early diagnosis and prompt operation are both necessary." Dr. Martin of New Orleans, in discussing the paper by Dr. Rodman, endorsed his view by suggesting that "Physicians and the public alike should be educated." At the second International Cancer Conference, held in Paris, October, 1910, Prof. von Czerny, president of the International Association for Cancer Research, laid emphasis on the belief that "the education of the medical profession was essential to the early diagnosis of cancer." Dr. J. C. Bloodgood in an address on "The Surgical Treatment of Cutaneous Malignant Growths," read in the Section on Dermatology of the American Medical Association, June, 1910, reemphasized this suggestion in the statement that it seemed well worth while "to educate the public, and to educate the physician," and that both "should be impressed with the importance of the immediate and complete removal of any congenital mole showing evidence of growth, superficial ulceration, or scab formation." Dr. J. H. Jacobson of Toledo, in an extended address on "The Results Obtained by the Radical Abdominal Operation for Carcinoma of the Uterus," concludes that "The real problems at the present time in the treatment of uterine cancer are not what particular operation gives the best results, but, rather, how such patients can be operated on earlier and how the primary mortality of the radical abdominal operation can be further reduced. The first problem can be solved only by a campaign of education in our medical schools and in our medical societies, together with some form of public instruction similar to that which has been inaugurated in Germany by Dührssen and Winter."*

*As early as 1802 a Society for Investigating the Nature and Cure of Cancer, was organized in London. Under the auspices of some of the foremost physicians of the period a letter of inquiry was sent out to the principal physicians of England containing thirteen questions, in regard to the diagnostic indications of cancer, the pathological and anatomical nature of cancer, whether a primary disease or a transitional pathological condition, whether inherited. whether infectious, whether related to other diseases, chiefly scrofulous and syphilitic, whether affected by climate and topography, whether affected by temperamental predisposition, whether met with among animals, etc. (J. Wolff, Lehre von der Krebskrankheit, Vol. i, p. 81.)

THE MORTALITY FROM CANCER

Dr. H. J. Boldt of New York, in a discussion of how we may reduce the mortality from cancer of the uterus, with special reference to treatment and to publicity through the lay press,* gives the weight of his endorsement to the plan of public education, in the direction of the dissemination of knowledge regarding the early symptoms of cancer of the uterus through the medium of the newspapers and the periodical press. He remarks that in this publicity work, if undertaken in this country, we would be following "in the footsteps of Germany, where the dissemination of knowledge by similar means was begun by Dührssen of Berlin many years ago, and later, on a more extensive scale, by Winter of Königsberg." He, however, suggests that "more practical benefits would be gained by impressing upon physicians the grave risk of treating with internal or local medication, before having made sure that no malignant condition was present, a patient having even the slightest suspicious symptom," and he, no doubt, is entirely sound in his final conclusion, that "The promulgation of knowledge regarding cancer of the uterus through the lay press, as advised at the last meeting of a large national gathering, cannot bring about a lowering of mortality from uterine cancer to such an extent as would be the case if the medical profession—the family physician—did the teaching directly."

Dr. Parker Syms of New York, in a public address on "The Prevention and Cure of Cancer,"† also remarks that "Most of our teaching must come through the physician in his practice. If that were well done it would be far better than anything that could be done otherwise in the way of spreading knowledge by literature," but, he observes, "there are some things it is well for the public to know. It is well for them to know that every lump and every swelling is more or less suspicious; they should know that cancer has no definite characteristic symptom which distinguishes it from other conditions. And they should know, also, that a physician can give intelligent advice only after he has made a most careful examination in any case." He draws attention to the possibilities of effective aid to be rendered by life insurance companies by the dissemination of knowledge among their policyholders as to how to prevent cancer. He concludes that a public campaign "should not only be nation wide, but world wide; and the more quickly it is started on a uniform basis with good organization the more quickly will it become effective."

In an address before the New York Academy of Medicine, May 15, 1913, Dr. Willy Meyer of New York, suggested that "The public should be taught the early signs of cancer," and that "It is to be hoped that by publicity the same results which have been achieved with those afflicted with tuberculosis may be obtained in patients afflicted with cancer." In an address read before the American Gynecological Society, Washington, D. C., May, 1913, Dr. F. J. Taussig considers the best methods of educating American women concerning cancer, advising that physicians should be the prime movers in the organization of societies for the control of cancer, but that the educational work itself should be, as in the case of tuberculosis, left largely in the hands of the laity. He

Journal of the American Medical Association, March 29, 1913.

†*Medical Record*, May 17, 1913.

refers to the fact that in 1904, in the discussion of a paper by Dr. Sampson, on the early recognition of uterine cancer, he had advocated that this work should be done by the American Medical Association; but he had come to the conclusion that "the organization should be under the control of the laity, and only the direction of the work should be in the hands of the medical profession."

Dr. W. A. Bryan of Nashville, Tenn., in the chairman's address at the public session of the Southern Medical Association, Lexington, Ky., November, 1913, said that "There is a far greater necessity for instruction of the laity on the subject of cancer than of the medical profession, for in the vast majority of cases of hopeless cancer, hopeless because of delay, we are able to learn that the physician's patience had been exhausted trying to convince a wilful patient of the necessity for action." He adds the further convincing observation that "The consent [to a surgical operation] usually comes after the disease has fulfilled the necessarily very plain requisites to satisfy the dull diagnostic abilities of the patient himself. He [the patient] desired interference only as a last resort, and last-resort therapy terminates almost uniformly in death. The layman must learn certain things he does not know, and must unlearn much that he thinks he knows before his part in the cancer problem can be performed."

Public Education in Methods of Cancer Control

The first comprehensive statement regarding the salient facts of the cancer problem of interest and importance to the laity is a treatise on "The Control of a Scourge—How Cancer is Curable," by Charles P. Childe, F. R. C. S., Surgeon Royal Portsmouth Hospital, England, published in the New Library of Medicine, 1906. The work includes extended consideration of the conditions under which cancer is curable or not, with observations on the dread of operation, the first danger-signals, the possibilities of prevention, the urgent need of public education, the serious menace of alleged cancer cures, the measurable evidence of a considerable degree of success in early operative treatment, etc.

A similar work written primarily for the instruction of the public, but of value, also, to the medical profession, is a small treatise on "Preventable Cancer," by Rollo Russell, published in London, 1912. The work includes an extended statistical survey of cancer throughout the world, and some exceptionally valuable observations on the relation of diet to cancer frequency, the temperature of food, the increase of excessive alimentation, and a rough outline of certain supposed factors accountable for cancer occurrence.*

Works of this character are unquestionably of great value in stimulating the development of an intelligent but restrained public interest in

*Among recent educational pamphlets on the cancer problem published in the furtherance of the efforts of the American Society for the Control of Cancer, mention requires to be made of the following, issued by the Council on Health and Public Instruction of the American Medical Association: "Control of Cancer," Joseph C. Bloodgood, "Cancer of the Skin," Henry H. Hazen, "Cancer of the Womb," Franklin H Martin, "Cancer of the Genito-Urinary Organs," Hugh H. Young. The American Society for the Control of Cancer has issued two suggestive pamphlets, "Cancer as a Social Problem" and "The Role of the Nurse in the Campaign Against Cancer," prepared by the Executive Secretary of the Society, Mr. Curtis E. Lakeman. An exceptionally valuable publication made available for nation-wide distribution has been issued by the Health Education League of Boston, prepared by Dr. Robert B. Greenough of the Medical School of Harvard University.

the many practical questions which require consideration in the furtherance of a public campaign for the control of cancer: the arrest of the persistent increase in the cancer death rate and the ultimate reduction of the appalling mortality from malignant disease. It is, therefore, of the utmost importance that a movement of this kind should be carried forward under the auspices of a National Society for the Control of Cancer, directed by laymen, physicians and surgeons of established reputation, and entitled to the confidence of the general public. Following the public discussion of the menace of cancer during the early part of 1912, the American Society for the Control of Cancer was formed in the City of New York, on May 22, 1913, with the object, as laid down in the constitution, "To disseminate knowledge concerning the symptoms, diagnosis, treatment and prevention of cancer, to investigate the conditions under which cancer is found and to compile statistics in regard thereto." Under the auspices of this society many public meetings have been held throughout the United States, under the immediate direction of local committees appointed by the state or county medical societies, in cooperation with influential laymen and laywomen interested in the cancer cause. The Society has also been instrumental in bringing about a more active interest on the part of the public-health authorities in the dissemination of general knowledge regarding cancer symptoms, diagnosis and treatment, with the result that there has been a vast amount of publicity of salient facts concerning cancer frequency, diagnosis, treatment and cure, on the basis of approved principles in the practice of medicine, to the measurable benefit of the public. The movement has the hearty endorsement of the principal national medical and surgical associations, and the active support of many influential lay persons throughout the nation.*

It has therefore seemed appropriate to include in Appendix H a reprint of an educational circular published by the American Society for the Control of Cancer, and widely distributed throughout the country in the furtherance of its public campaign.†

In this direction, then, would seem to lie the only hope of cancer cure and cancer control. To the extent that the public at large becomes thoroughly cognizant of the true menace of malignant disease, the practical possibilities of effective control become self-evident. Understanding alone, not mere knowledge, is power; and a thorough understanding of fundamental principles, methods and results is nowhere likely to prove more useful and far-reaching than in the vast domain of preventive medicine and public health. The difficulties to be

*Tables 3 and 4, Appendix H. See in this connection the Report on the Health of Portsmouth for the Year 1913, issued during the early part of 1915, pp. 34-37, the Report on the Health of Rochdale for 1913, and the Report of the Metropolitan Borough of Paddington for 1913, pp. 64-68. According to the annual report of Dr. A. M. Fraser, the Medical Officer of Health of Portsmouth for 1914, there were only 197 deaths from cancer in Portsmouth during that year, as compared with 230 in 1913. It is pointed out in this connection that "this *decrease*, which occurs in the face of an increase of population, is hailed with satisfaction by the Portsmouth sanitary authorities as justifying their efforts to reduce the cancer death rate by persuading persons who are attacked with this disease to avoid delay and to seek treatment before it is too late for more than palliative measures." Dr. Fraser also reports that from statements made to him by local medical men the publication of circulars and newspaper articles by the health department has been instrumental in inducing a number of persons suffering from early operable cancer to secure treatment, the result of which, it is hoped, will be permanent.

†Tables 1 and 2, Appendix H.

overcome are appalling; but the objects to be achieved are well worthy of the most strenuous effort and the not inconsiderable expense. Qualified cancer research into the underlying conditions or circumstances accountable for the occurrence of the disease must needs rank as a problem of the first order of importance in medicine and surgery; but every branch of science related thereto should derive some benefit from the statistical evidence brought forward in this work for the sole purpose of facilitating the scientific study of what is, what ever has been and what is ever likely to remain one of the most complex problems of human life. The cause of cancer control also should derive some direct advantage from this concise and comprehensive presentation of the truly colossal loss of life throughout the entire civilized world in consequence of the unchecked ravages of malignant disease, and the additional and indisputable evidence that the disease is on the increase, in marked and significant contrast to the decline in the death rate from practically all the other principal causes of death.

Aside from humanitarian motives, which in the furtherance of a policy of scientific welfare work on the part of life insurance companies suggests exhaustive inquiries of this kind, there are the strongest possible reasons for believing that a nation-wide campaign for the control of cancer must, in the process of time, prove of direct benefit to life insurance policyholders, as well as to the public at large. In proportion as such efforts are successful, it is obvious that encouragement is given to similar research work into the comparative frequency and observed tendencies of other diseases more or less within the range of prevention and control.

Future Statistical Research

The future statistical study of cancer gives promise of far-reaching results of great practical usefulness. In no direction are such results more likely to be valuable than in the standardized tabulation and critical analysis of the experience data of large hospitals and private clinics. The mere publication of crude and superficially considered data is, on the other hand, a serious menace to the cancer cause. Entirely too much reliance is placed upon rates or percentages derived from a small number of cases, and, as a general rule, the fundamental law of large numbers, which underlies all qualified statistical analysis, is completely ignored. The value of many an important contribution to the etiology of cancer would be materially increased if the observations were made to rest upon a larger number of critically considered individual facts. The vast amount of institutional experience obtainable through the records of American and foreign hospitals is at present either unavailable or published in a form more or less useless for practical purposes. The correlation value of such data to the naturally much larger amount of mortality experience derived from general or life insurance sources can not easily be exaggerated. To a not inconsiderable extent the future of qualified cancer research depends upon an unimpeachable statistical basis.

THE MORTALITY FROM CANCER

Restatement of Conclusions and Results

Much if not most of the available statistical information regarding cancer mortality is tentative, and trustworthy only in an approximate sense. Extreme caution is always necessary in the use of the data; but in the main it is held that the information can be relied upon to justify broad conclusions. These, in brief, as deducible from the statistical and other evidence presented in this work, are summarized or restated as follows:

The first chapter presents in outline the general principles of statistical inquiry and emphasizes the practical utility of the statistical method in medicine and its particular application to the numerous and important general aspects of the cancer problem. Regardless of the inherent difficulties of cancer terminology, exact diagnosis and precise classification, it is held that the statistical method is trustworthy and useful for the present purpose, and in the main at least approximately conclusive regarding local cancer frequency and the observed upward tendency of the cancer death rate throughout the civilized world.

In the second chapter the statistical basis of cancer research is further considered, and the need of an even more exhaustive study than the present one is frankly conceded as an essential requirement for a full understanding of all the salient facts of the cancer problem. The adoption of uniform methods of tabulation and analysis is suggested to registration officials, public hospitals and life insurance companies of at least the more important countries of the world; but even under existing statistical limitations the official returns for some twenty-six per cent. of the world's population have been utilized for the present purpose. It is maintained that this vast amount of general cancer mortality information is in sufficient agreement to warrant the far-reaching conclusion *that the menace of cancer throughout the civilized world is much more serious than has generally been assumed to be the case.*

The problem of cancer increase is considered in some detail in the third chapter, with a due regard to the ascertained underlying conditioning factors determining local variations in the death rate and the more or less controversial arguments as to the apparent or actual increase in cancer frequency as affected to a variable degree by serious errors in diagnosis or obvious mistakes in death certification. The conclusion is advanced, and without hesitation, that *the evidence of cancer increase throughout the world is an incontrovertible statistical fact, and absolutely conclusive*; and it is maintained further that arguments to the contrary are largely in the nature of useless controversies, failing conspicuously in the required evidence of actual errors and defects in the original data sufficient in number to invalidate the utility of the returns as a whole. It is held in this connection that American vital statistics are strictly comparable with the mortality statistics of European and other countries, upon the assumption that absolute accuracy is not necessarily essential to the present purpose, nor attainable under any conceivable existing conditions, also, that the approximate truth as revealed by the present investigation, in strict conformity to the law of large numbers, fully justifies the conclusion *that the mortality from cancer is increasing at a more or less alarming rate throughout the entire civilized world and that*

this increase implies most serious consequences, present and future, to the populations concerned.

Preliminary to the discussion of the statistical evidence in general, the mortality from cancer in different occupations is presented in the fourth chapter, and amplified with numerous interesting and suggestive illustrations of exceptional cancer frequency in particular employments. It is readily conceded that at the present time the available cancer statistics by occupations are of rather limited practical utility; but it is suggested that thoroughly qualified and highly specialized inquiries in this direction are quite certain to yield important results.

Cancer as a problem of life insurance medicine is discussed at some length in the fifth chapter, with a brief historical survey of the mortality from malignant disease in the experience of life insurance companies throughout the world. The data presented fully sustain the general conclusion that cancer is a much more serious mortality problem than has generally been assumed to be the case, and that without question the disease is on the increase among life insurance policyholders, medically selected, as well as among the population at large. Of interest in this connection are the suggestive results of the Medico-Actuarial Investigation, especially as regards the influence of overweight on the cancer death rate, the negative evidence regarding the influence of heredity or family history, and, finally, the important modifications in the cancer death rate resulting from marital or conjugal condition.

The geographical incidence of cancer throughout the world is briefly reviewed in the sixth chapter, with some consideration of related diseases, such as biliary calculi and non-malignant tumors of the uterus and ovaries. The comparative statistics of cancer by specified organs and parts for selected countries, for which the returns are of approximately the same degree of intrinsic trustworthiness, leave no room for any other conclusion than *that practically all forms of cancer are on the increase*, but naturally to quite a variable degree. An international comparison of crude cancer death rates for the period 1908-12, based upon the official returns of more than one and a half million deaths for the five continents combined, indicates with approximate accuracy that the highest cancer death rate prevails in Europe and that the lowest rate prevails on the continent of Africa. Cancer mortality is exceptionally high in Switzerland, Bavaria and Holland, and extremely rare among North American Indians and the primitive races of Asia and Africa.

The returns for American states and cities are presented in some detail in the seventh chapter, and the corresponding data for foreign countries are discussed in chapter eight. There is included in these two chapters a brief consideration of cancer frequency as modified by latitude, size of cities and climatic conditions, seemingly warranting the conclusion that *cancer frequency decreases with diminishing distances from the equator*, or, what is practically the equivalent thereof, a rise in cancer mortality is observed to occur with a diminishing mean annual temperature and rainfall.

In the ninth and concluding chapter a variety of aspects of the cancer problem are briefly considered for the purpose of facilitating the practical use and correct interpretation of the numerous statistical tables and

forms in the appendices. The primary object of this discussion is to illustrate the extremely complex nature of the cancer problem and the more or less determining influence of widely different and constantly varying special factors and local conditions. The extreme rarity of cancer among primitive races, such as the North American Indian, and the relative infrequency of special forms of cancer among certain types of mankind, such as the comparative freedom from cancer of the breast of Japanese women, are brought forward as proof that *even a very low cancer death rate is not necessarily evidence of the intrinsic untrustworthiness of the returns.*

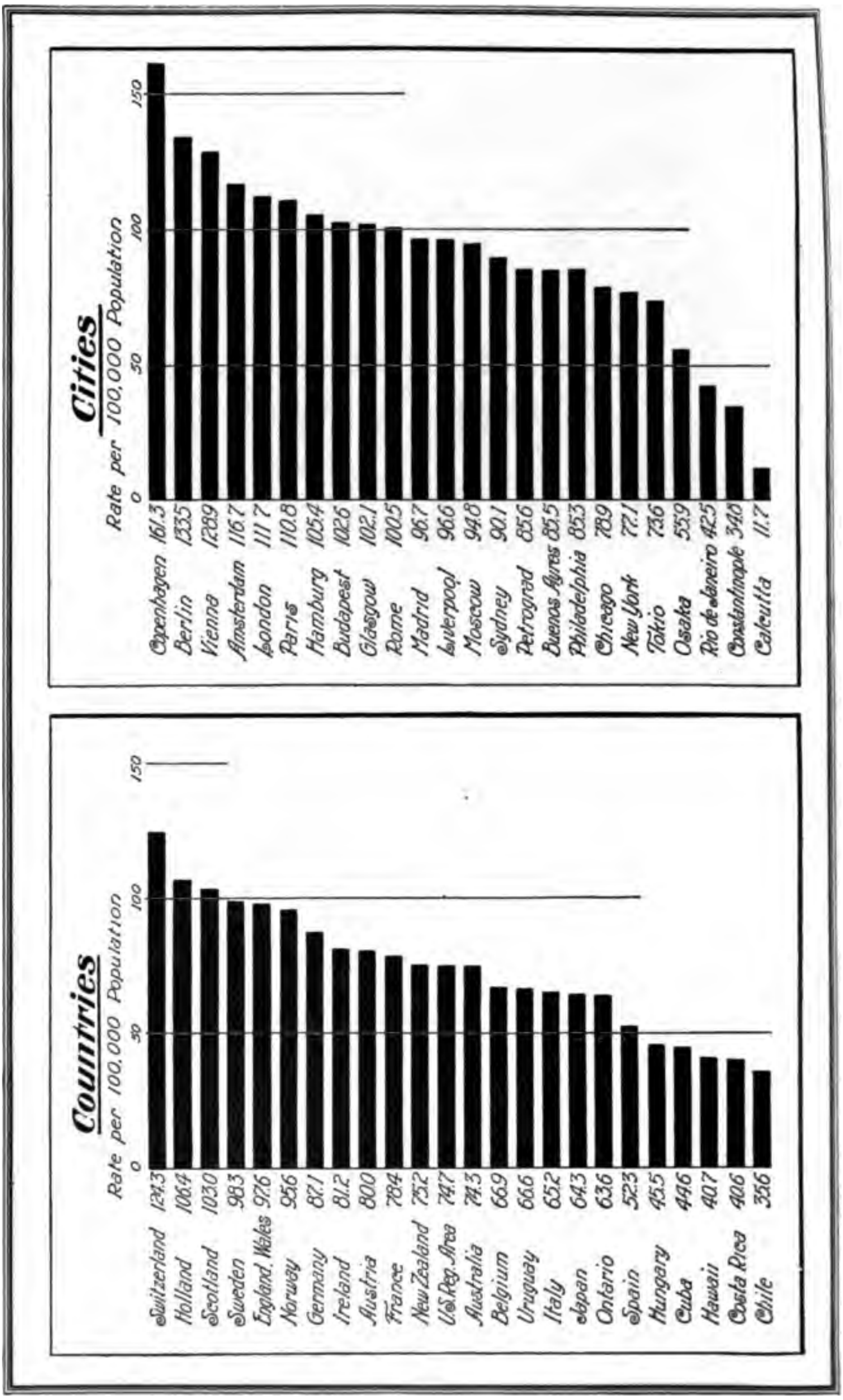
These illustrations also throw much light upon the broader aspects of the problem of cancer causation, or, in a more limited sense, the conditioning circumstances which more or less determine the local degree of cancer frequency in different countries and localities of the civilized world. Precancerous conditions are considered at some length, and it is suggested that a more extended study should be made of the coincident occurrence of cancer and other diseases, chiefly gall-stones, syphilis, leprosy, rheumatism, gout, appendicitis, diabetes and tuberculosis. The surgical aspects are briefly discussed, and with special reference to the at present inadequate statistics of cancer hospitals, which are most urgently in need of standardization, so as to facilitate the comparative study of the results of institutional treatment. It is furthermore suggested that the subject of post-operative results should receive qualified statistical consideration, in that most of the available data are at present of doubtful intrinsic trustworthiness. The same considerations apply to the problem of recurrence, the average duration of the disease, the relative degree of malignancy and the rapidity of growth. All of these are important practical aspects of the general cancer problem, whether medically or surgically considered. *With regard to heredity and family history, some additional observations reemphasize earlier conclusions that the available evidence in this respect is in the negative.* The relation of cancer frequency to overnutrition, metabolic disorders, vegetarianism and diet in general suggests the correlation of cancer frequency to overnutrition, as best illustrated by the statistical evidence derived from the results of the Medico-Actuarial Investigation, that cancer is more common among overweights than among underweights. Chronic irritation as an immediate factor of cancer causation, first considered with reference to occupation, in another chapter, is here further discussed with regard to alcohol and smoking. The available statistical data would seem to indicate that both alcohol and smoking are directly contributory factors, to a variable degree, and particularly so as regards certain organs or parts of the body affected. The extremely important question as to whether cancer is of a parasitical origin, and therefore possibly an infectious disease, is considered at some length, with especial reference to alleged cancer houses, streets, villages, etc. *The available evidence as regards a possible parasitical origin of cancer is held to be inconclusive.* This point is sustained by the vast surgical experience which is without a single record of surgical infection in cancer operations. The available data are also negative on the alleged causation of cancer by worry or its correlation to insanity. Though partly outside of the

general study of the subject from the statistical point of view, the modern theories of radium and radiotherapy are briefly referred to, with special reference to the statistical experience data of the London Radium Institute. The outlook is encouraging that as regards external cancers the radium treatment of the future will prove productive of much more satisfactory results than the treatment of the past. As regards the effective and exclusive use of radium in the treatment of internal cancers the evidence at present is quite contradictory and inconclusive.

Reviewing the aggregate results of the present investigation, it is shown that cancer is much more common than has generally been assumed to be the case; that the mortality from the disease throughout the civilized world exceeds 500,000 per annum, and in the United States about 80,000 at the present time; that the disease is increasing in practically all civilized countries and as a general rule in all its principal forms or varieties, and that it is therefore strictly within the limits of scientific conjecture that a further rise in the death rate may be anticipated, unless the disease is made subject to more effective methods of treatment and control. The attainment of this purpose can be brought about only by arousing a world-wide interest in the problem of cancer control, rather than in the strictly scientific aspects of cancer causation, and the development of a sound public understanding of the imperative necessity of early surgical and possibly other interference in place of blind reliance upon more or less disappointing methods of treatment by other means. All of these and many other more or less controversial aspects of the cancer problem urgently suggest the broadening of the scope of statistical research and the perfection of methods of statistical inquiry, towards the end that the whole truth of the cancer problem may be revealed to the immeasurable advantage of the human race.

CHARTS

International Statistics of Cancer Mortality, 1908—1912



1	Switzerland	18,686,442	23,228	124.3
2	Holland	29,479,395	31,375	106.4
3	Scotland	23,686,521	24,399	103.0
4	Sweden	5,561,799	5,470	98.3
5	England and Wales	178,980,717	174,602	97.6
6	Norway	11,986,594	11,461	95.6
7	Germany	318,876,524	277,710	87.1
8	Ireland	21,925,004	17,796	81.2
9	Austria	141,462,903	113,221	80.0
10	France	157,919,000	123,840	78.4
11	New Zealand	4,963,912	3,731	75.2
12	U. S. Registration Area	271,207,437	202,621	74.7
13	Australia	22,583,681	16,778	74.3
14	Belgium	36,936,410	24,712	66.9
15	Uruguay	5,587,270	3,720	66.6
16	Italy	171,995,665	112,087	65.2
17	Japan	148,774,060	95,724	64.3
18	Ontario	12,448,898	7,912	63.6
19	Spain	97,705,000	51,135	52.3
20	Hungary	104,006,496	47,374	45.5
21	Cuba	10,892,077	4,855	44.6
22	Hawaii	962,860	392	40.7
23	Costa Rica	1,849,534	751	40.6
24	Chile	17,047,786	6,077	35.6

Note: The data for France are for 1908-11, for Japan, 1908-10, and for Sweden, 1911 only; all other data are for 1908-12.

1	Copenhagen	2,744,628	4,427	161.3
2	Berlin	10,361,160	13,831	133.5
3	Vienna	10,064,070	12,971	128.9
4	Amsterdam	2,874,663	3,355	116.7
5	London	22,671,154	25,322	111.7
6	Paris	14,111,481	15,638	110.8
7	Hamburg	5,006,244	5,276	105.4
8	Budapest	4,337,060	4,450	102.6
9	Glasgow	3.918,239	4,001	102.1
10	Rome	2,670,945	2,679	100.5
11	Madrid	1,705,104	1,649	96.7
12	Liverpool	3,716,551	3,592	96.6
13	Moscow	4,698,492	4,452	94.8
14	Sydney	3,114,640	2,805	90.1
15	Petrograd	3,926,304	3,360	85.6
16	Buenos Ayres	6,406,275	5,475	85.5
17	Philadelphia	7,745,040	6,610	85.3
18	Chicago	10,926,412	8,618	78.9
19	New York	23,834,415	18,385	77.1
20	Tokio	5,029,079	3,700	73.6
21	Osaka	3,699,572	2,069	55.9
22	Rio de Janeiro	3,357,032	1,427	42.5
23	Constantinople	5,750,000	2,001	34.8
24	Calcutta	4,456,200	522	11.7

Note: The data for Madrid, Tokio and Osaka are for 1908-10, for Moscow, 1910-12, and Petrograd for 1911-12; all other data are for 1908-12.

Comparative Cancer Mortality in American and Foreign Cities, 1881-1914

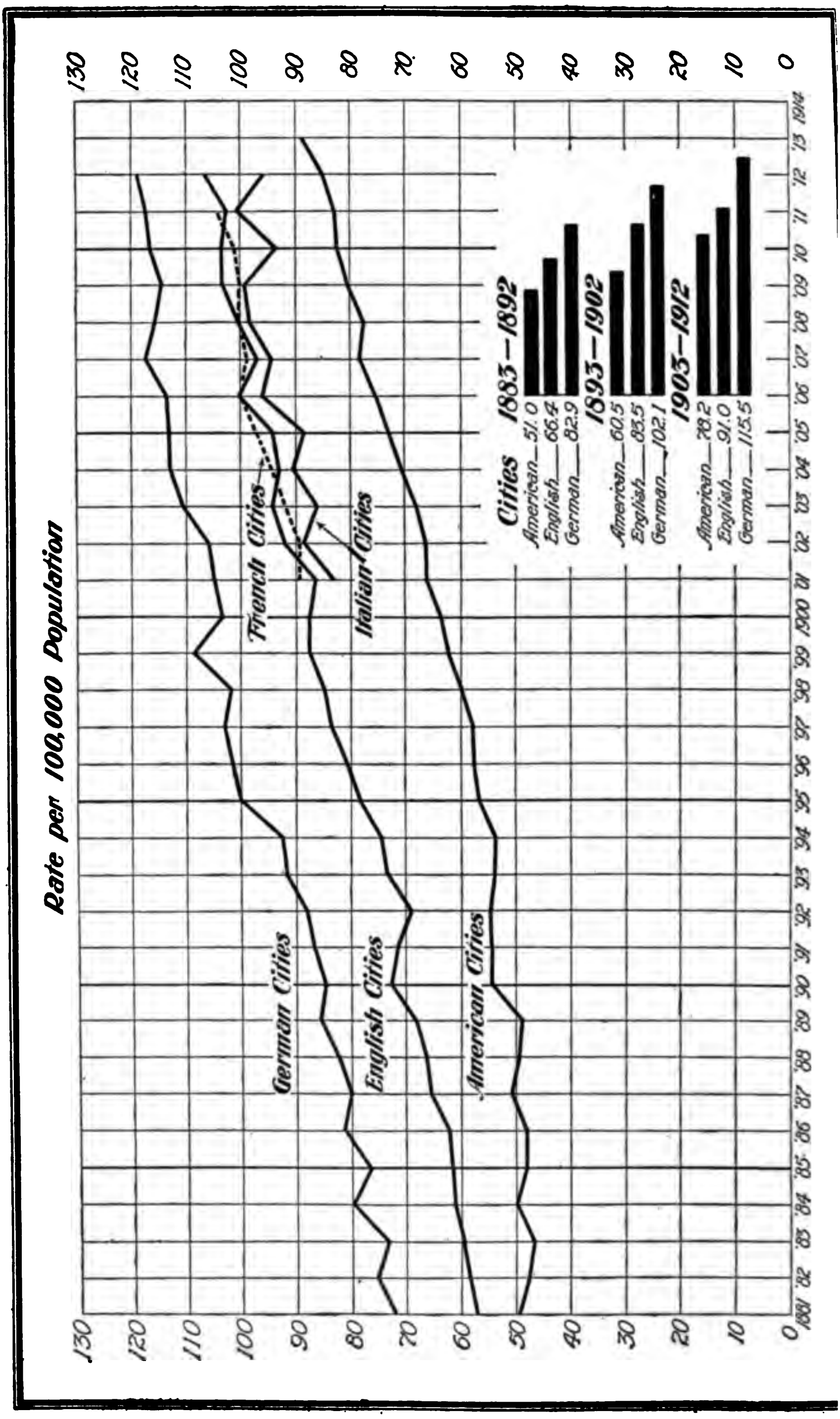


Chart No. 2. Comparative Cancer Mortality in American and Foreign Cities, 1881-1914

TWENTY AMERICAN CITIES			
Year	Population	Deaths from Cancer	Rate per 100,000 Pop.
1881	5,673,905	2,812	49.6
1882	5,869,498	2,820	48.0
1883	6,065,384	2,847	46.9
1884	6,261,552	3,137	50.1
1885	6,458,008	3,119	48.3
1886	6,658,686	3,209	48.2
1887	6,859,665	3,495	51.0
1888	7,059,924	3,512	49.7
1889	7,261,499	3,567	49.1
1890	7,463,170	4,101	54.9
1891	7,702,582	4,213	54.7
1892	7,942,266	4,371	55.0
1893	8,182,229	4,431	54.2
1894	8,422,476	4,547	54.0
1895	8,662,957	4,951	57.2
1896	8,909,328	5,178	58.1
1897	9,155,967	5,325	58.2
1898	9,402,921	5,649	60.1
1899	9,650,196	6,047	62.7
1900	9,897,855	6,334	64.0
1901	10,157,693	6,771	66.7
1902	10,417,536	6,964	66.8
1903	10,677,385	7,399	68.4
1904	10,937,234	7,778	71.1
1905	11,197,087	8,215	73.4
1906	11,472,516	8,713	75.9
1907	11,747,948	9,274	78.9
1908	12,023,381	9,355	77.8
1909	12,298,814	9,934	80.8
1910	12,574,254	10,425	82.9
1911	12,849,687	10,713	83.4
1912	13,125,121	11,203	85.4
1913	13,400,553	11,971	89.3
1914	..	..	..

TEN ENGLISH CITIES			
Year	Population	Deaths from Cancer	Rate per 100,000 Pop.
1881	5,187,155	2,970	57.3
1882	5,236,715	3,070	58.6
1883	5,498,412	3,288	59.8
1884	5,545,342	3,400	61.3
1885	5,893,206	3,632	61.6
1886	6,122,929	3,816	62.3
1887	6,178,750	4,072	65.9
1888	6,233,881	4,160	66.7
1889	6,289,377	4,321	68.7
1890	6,348,329	4,648	73.2
1891	6,803,824	4,901	72.0
1892	7,020,022	4,894	69.7
1893	7,076,744	5,232	73.9
1894	7,135,419	5,351	75.0
1895	7,323,426	5,773	78.8
1896	7,386,978	5,969	80.8
1897	7,450,906	6,265	84.1
1898	7,599,659	6,478	85.2
1899	7,665,283	6,748	88.0
1900	7,774,195	6,843	88.0
1901	7,867,156	6,827	86.8
1902	7,905,959	7,306	92.4
1903	7,927,988	7,506	94.7
1904	7,950,116	7,435	93.5
1905	8,058,580	7,634	94.7
1906	8,083,014	8,125	100.5
1907	8,107,571	7,896	97.4
1908	8,132,257	8,196	100.8
1909	8,157,065	8,450	103.6
1910	8,238,886	8,563	103.9
1911	8,258,662	8,498	102.9
1912	8,618,398	9,216	106.9
1913	..	..	..
1914	..	..	..

FIFTEEN GERMAN CITIES			
Year	Population	Deaths from Cancer	Rate per 100,000 Pop.
1881	2,957,221	2,132	72.1
1882	3,034,611	2,291	75.5
1883	3,109,877	2,287	73.5
1884	3,188,610	2,558	80.2
1885	3,278,695	2,518	76.8
1886	3,380,117	2,761	81.7
1887	3,493,524	2,808	80.4
1888	3,618,048	2,991	82.7
1889	3,859,806	3,318	86.0
1890	4,801,696	4,075	84.9
1891	4,994,354	4,356	87.2
1892	5,099,794	4,510	88.4
1893	5,190,589	4,780	92.1
1894	5,294,617	4,917	92.9
1895	5,431,735	5,452	100.4
1896	5,631,753	5,736	101.9
1897	5,805,167	5,994	103.3
1898	5,975,960	6,103	102.1
1899	6,176,201	6,734	109.0
1900	6,432,453	6,673	103.7
1901	6,622,175	6,976	105.3
1902	6,725,849	7,153	106.4
1903	6,928,797	7,695	111.1
1904	7,101,881	8,048	113.3
1905	7,370,445	8,357	113.4
1906	7,561,707	8,610	113.9
1907	7,709,625	9,081	117.8
1908	7,835,222	9,087	116.0
1909	7,968,005	9,146	114.8
1910	8,214,504	9,597	116.8
1911	8,372,458	9,838	117.5
1912	8,560,112	10,213	119.3
1913	..	..	..
1914	..	..	..

FRENCH CITIES*			
Year	Population	Deaths from Cancer	Rate per 100,000 Pop.
1901	13,771,440	12,385	89.9
1902	13,872,703	12,463	89.8
1903	13,973,967	12,912	92.4
1904	14,075,231	13,312	94.6
1905	14,176,495	13,793	97.3
1906	14,277,759	14,339	100.4
1907	14,464,803	14,384	99.4
1908	14,651,847	14,757	100.7
1909	14,838,892	14,907	100.5
1910	15,025,937	15,256	101.5
1911	15,212,982	15,897	104.5
1912	..	..	..
1913	..	..	..
1914	..	..	..

SEVEN ITALIAN CITIES			
Year	Population	Deaths from Cancer	Rate per 100,000 Pop.
1901	2,603,432	2,179	83.7
1902	2,652,358	2,361	89.0
1903	2,701,277	2,343	86.7
1904	2,750,196	2,500	90.9
1905	2,799,115	2,485	88.8
1906	2,848,034	2,746	96.4
1907	2,896,953	2,744	94.7
1908	2,945,872	2,907	98.7
1909	2,994,791	2,986	99.7
1910	3,043,710	2,858	93.9
1911	3,092,629	3,123	101.0
1912	3,141,548	3,022	96.2
1913	..	..	..
1914	..	..	..

*The data are for towns of over 5,000 population.

Cancer Mortality by Organs and Parts, 1908—1912

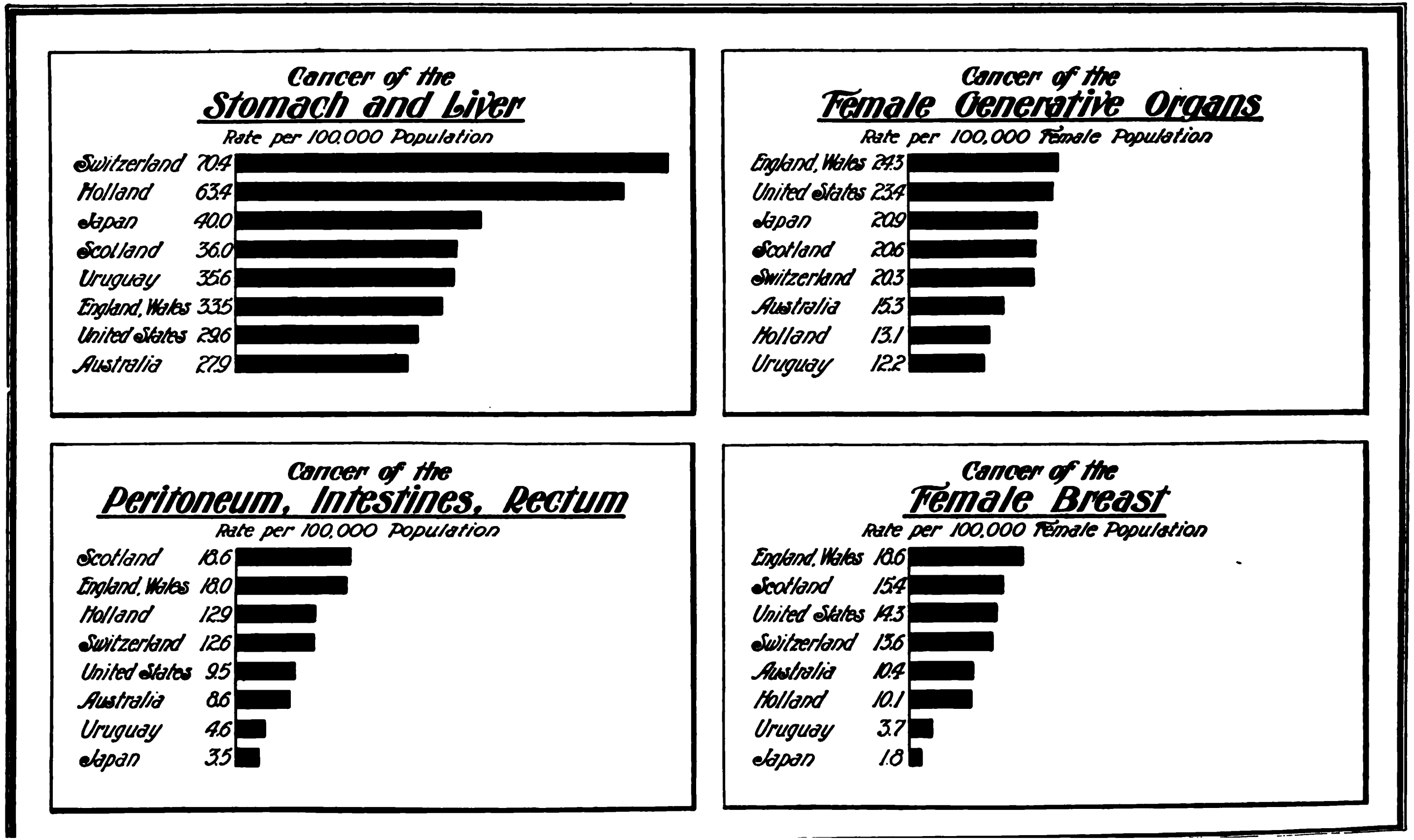


Chart No. 3. Cancer Mortality by Organs and Parts, 1908-1912

STOMACH AND LIVER

		Deaths from Cancer	Rate per 100,000 Pop.
1	Switzerland	12,838	70.4
2	Holland	18,679	63.4
3	Japan	39,861	40.0
4	Scotland	8,417	36.0
5	Uruguay	1,880	35.6
6	England and Wales	60,043	33.5
7	United States	80,316	29.6
8	Australia	6,135	27.9

PERITONEUM, INTESTINES AND RECTUM

1	Scotland	4,349	18.6
2	England and Wales	32,164	18.0
3	Holland	3,789	12.9
4	Switzerland	2,302	12.6
5	United States	25,644	9.5
6	Australia	1,886	8.6
7	Uruguay	242	4.6
8	Japan	3,461	3.5

FEMALE GENERATIVE ORGANS

		Deaths from Cancer	Rate per 100,000 Female Pop.
1	England and Wales	22,428	24.3
2	United States	30,907	23.4
3	Japan	10,322	20.9
4	Scotland	2,479	20.6
5	Switzerland	1,885	20.3
6	Australia	1,635	15.3
7	Holland	1,956	13.1
8	Uruguay	317	12.2

FEMALE BREAST

1	England and Wales	17,189	18.6
2	Scotland	1,856	15.4
3	United States	18,884	14.3
4	Switzerland	1,264	13.6
5	Australia	1,117	10.4
6	Holland	1,504	10.1
7	Uruguay	96	3.7
8	Japan	878	1.8

NOTE: The data for Scotland, Switzerland and Uruguay are for 1906-10, for Japan for 1909-10; all other data are for 1908-12.

Cancer Mortality by Age and Organs or Parts, 1903—1912

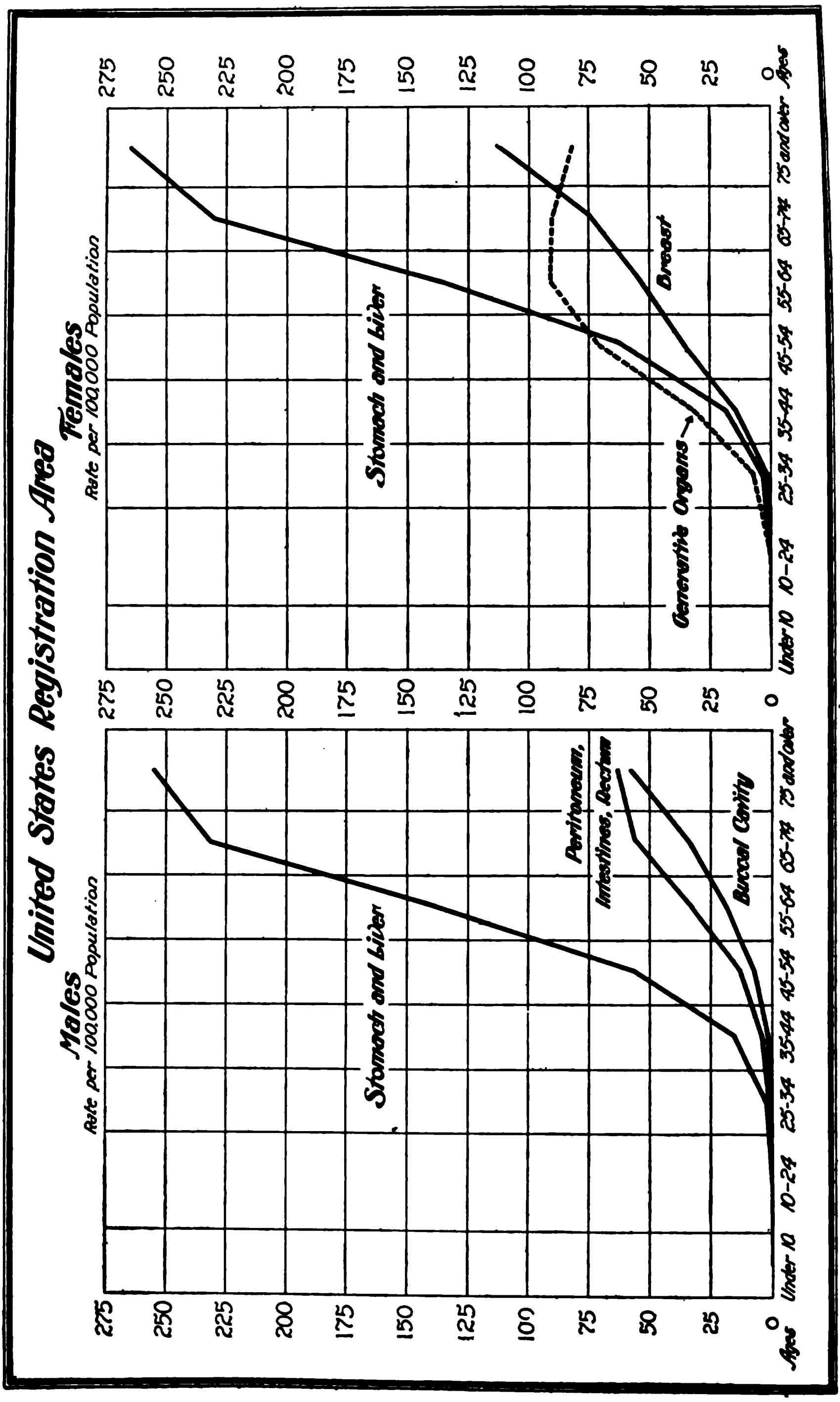


Chart No. 4. Cancer Mortality by Age and Organs or Parts, 1903-1912

United States Registration Area

MALES

Ages	Buccal Cavity: Deaths from Cancer	Buccal Cavity: Rate per 100,000 Pop.	Stomach and Liver: Deaths from Cancer	Stomach and Liver: Rate per 100,000 Pop.	Peritoneum, Intestines, Rectum: Deaths from Cancer	Peritoneum, Intestines, Rectum: Rate per 100,000 Pop.
Under 10	58	0.1	163	0.3	127	0.3
10-24	79	0.1	299	0.5	349	0.5
25-34	131	0.3	1,267	3.1	808	1.9
35-44	640	1.9	5,224	15.7	1,636	4.9
45-54	1,829	7.9	13,110	56.6	3,130	13.5
55-64	2,605	19.0	19,057	138.8	4,523	33.0
65-74	2,565	34.4	17,273	231.8	4,135	55.5
75 and over	1,732	58.4	7,569	255.4	1,888	63.7
All ages	9,652	4.2	64,049	27.5	16,615	7.1

FEMALES

Ages	Stomach and Liver: Deaths from Cancer	Stomach and Liver: Rate per 100,000 Pop.	Generative Organs: Deaths from Cancer	Generative Organs: Rate per 100,000 Pop.	Breast: Deaths from Cancer	Breast: Rate per 100,000 Pop.
Under 10	119	0.2	31	0.07	8	0.02
10-24	256	0.4	370	0.6	49	0.08
25-34	1,484	3.9	2,989	7.8	918	2.4
35-44	5,753	19.1	9,820	32.6	4,583	15.2
45-54	12,798	61.1	14,900	71.2	7,528	35.9
55-64	17,805	136.5	11,920	91.4	7,046	54.0
65-74	17,496	230.1	6,903	90.8	5,683	74.8
75 and over	8,911	265.9	2,756	82.2	3,836	114.5
All ages	64,685	29.0	49,747	22.3	29,685	13.3

Cancer Mortality by Sex and Age, 1901 and 1911

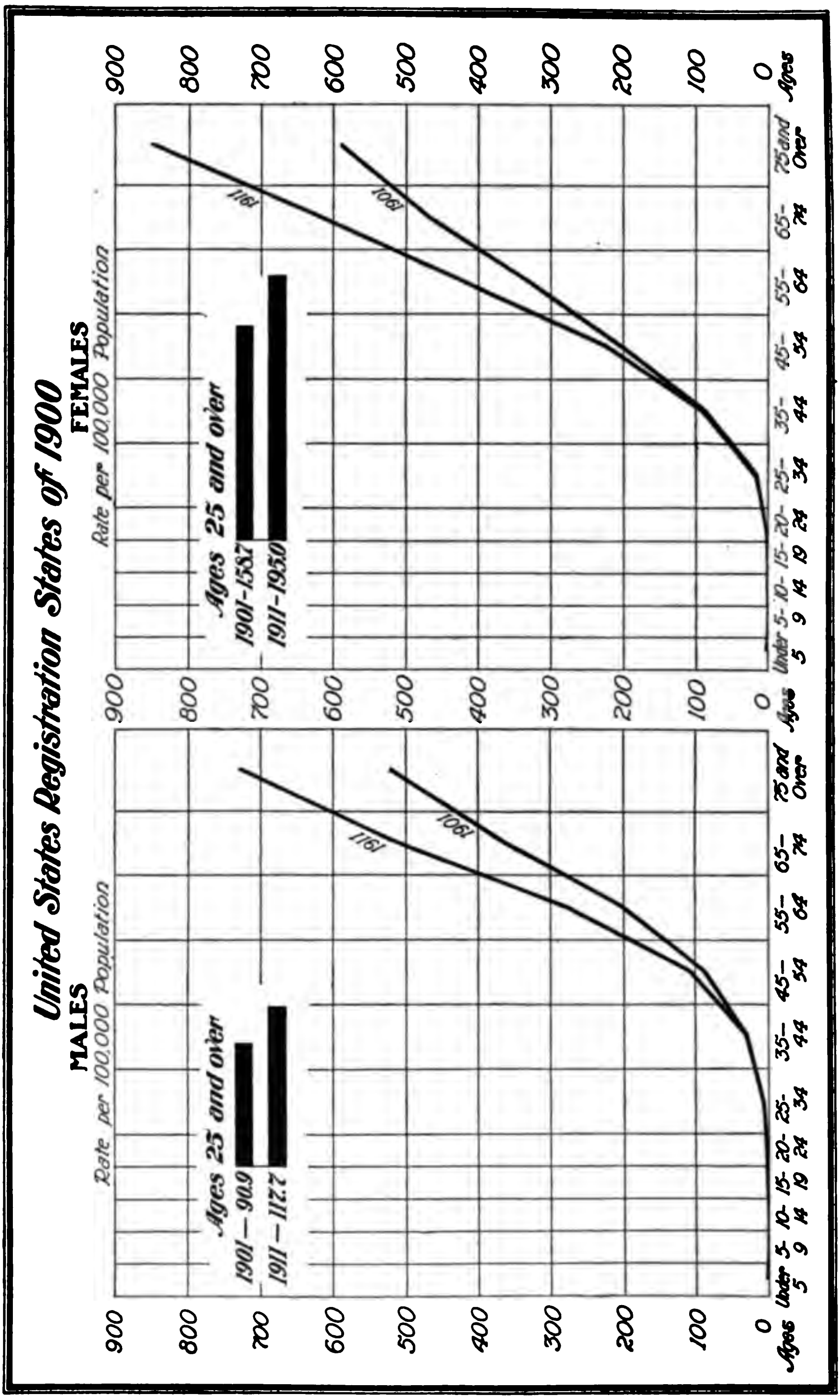


Chart No. 5. Cancer Mortality by Sex and Age, 1901 and 1911
United States Registration States of 1900

(Rate per 100,000 Population)

Ages	Males 1901	Males 1911	Females 1901	Females 1911
Under 5	3.8	3.1	3.1	3 0
5–9	1.3	1.3	0.8	1.1
10–14	0.9	1.0	0.9	1.5
15–19	1.9	2.9	2.2	1.7
20–24	3.3	4.9	4.5	4.6
25–34	9.4	8.7	17.5	19.4
35–44	32.5	31.1	89.6	92.5
45–54	90.0	109.2	205.4	227.0
55–64	203.8	283.4	331.8	422.3
65–74	366.0	512.8	468.9	617.8
75 and over	520.8	730.5	589.8	848.7
All ages:				
Crude rate	48.7	64.2	83.0	104.0
Standardized rate*	43.6	56.7	79.7	97.2

*Standardized for age distribution on the basis of the standard million of England and Wales for 1901.

Comparative Cancer Mortality by Race, 1891—1914

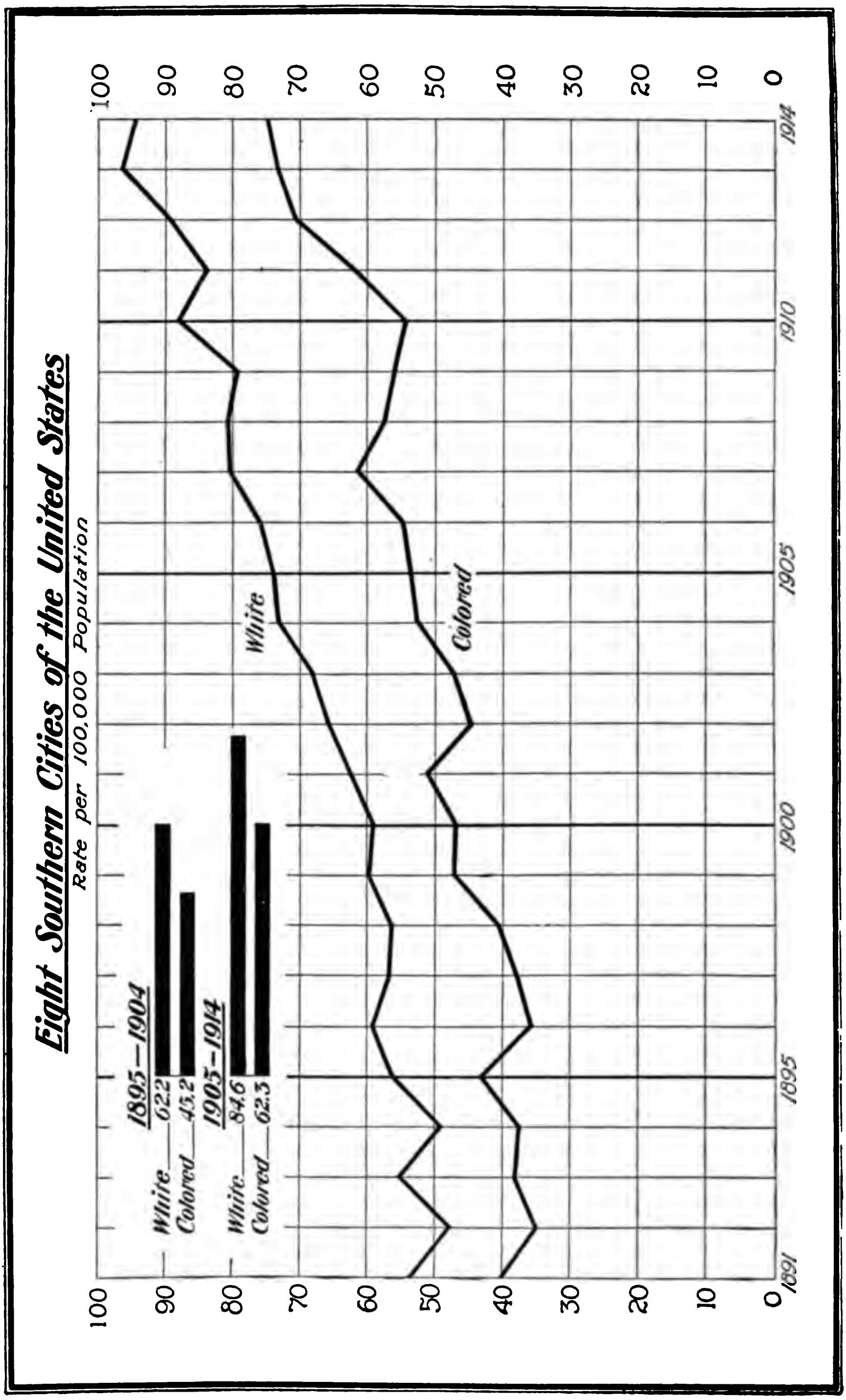


Chart No. 6. Comparative Cancer Mortality by Race, 1891-1914

EIGHT SOUTHERN CITIES OF THE UNITED STATES

Year	WHITE Population	WHITE Deaths from Cancer	WHITE Rate per 100,000 Pop.	COLORED Population	COLORED Deaths from Cancer	COLORED Rate per 100,000 Pop.
1891	891,823	480	53.9	358,638	144	40.2
1892	907,130	438	48.3	365,127	129	35.3
1893	923,238	512	55.5	371,576	143	38.5
1894	939,347	464	49.4	378,105	143	37.8
1895	955,456	541	56.6	384,595	167	43.4
1896	971,566	576	59.3	391,087	141	36.1
1897	987,678	563	57.0	397,577	152	38.2
1898	1,003,791	570	56.8	404,066	165	40.8
1899	1,019,904	613	60.1	410,557	195	47.5
1900	1,036,017	616	59.4	417,048	197	47.2
1901	1,057,588	664	62.8	422,319	217	51.4
1902	1,079,160	713	66.1	427,610	193	45.1
1903	1,100,732	753	68.4	432,893	206	47.6
1904	1,122,305	824	73.4	438,175	232	52.9
1905	1,143,880	846	74.0	443,456	239	53.9
1906	1,165,457	887	76.1	448,736	247	55.0
1907	1,187,034	956	80.5	454,016	280	61.7
1908	1,208,611	976	80.8	459,296	265	57.7
1909	1,230,188	979	79.6	464,576	261	56.2
1910	1,251,766	1,107	88.4	469,857	257	54.7
1911	1,273,338	1,071	84.1	475,138	296	62.3
1912	1,294,911	1,159	89.5	480,419	340	70.8
1913	1,316,492	1,272	96.6	485,699	357	73.5
1914	1,338,076	1,248	93.3	490,978	368	75.0
1895–1904	10,334,197	6,432	62.2	4,125,927	1,865	45.2
1905–1914	12,409,753	10,501	84.6	4,672,171	2,910	62.3

NOTE: Includes the cities of Baltimore, Md., Washington, D. C., New Orleans, La., Memphis and Nashville, Tenn., Richmond, Va., Savannah, Ga., and Charleston, S. C.

Cancer Mortality by Race—Maryland, 1909—1913

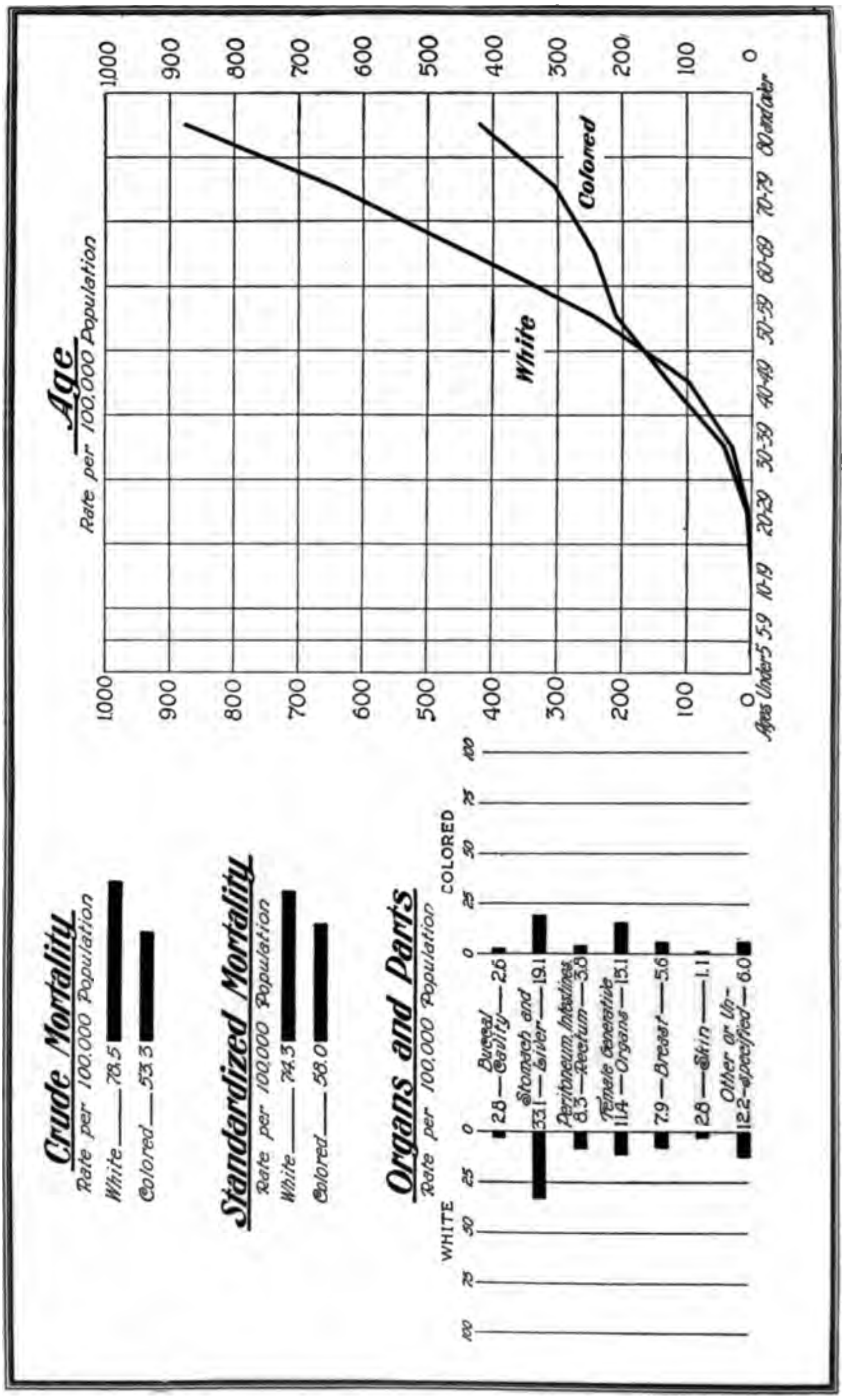


Chart No. 7. Cancer Mortality by Race—Maryland, 1909-1913

CRUDE AND STANDARDIZED MORTALITY

(Rate per 100,000 Population)

	White	Colored
Crude rate	78.5	53.3
Standardized rate*	74.3	58.0

MORTALITY, BY ORGANS AND PARTS

Organ or Part	White	Colored
Buccal cavity	2.8	2.6
Stomach and liver	33.1	19.1
Peritoneum, intestines and rectum	8.3	3.8
Female generative organs	11.4	15.1
Breast	7.9	5.6
Skin	2.8	1.1
Other or unspecified	12.2	6.0

MORTALITY, BY AGE AND RACE

(Rate per 100,000 Population)

Age	White	Colored
Under 5	3.2	3.0
5–9	1.5	0.0
10–19	1.7	2.1
20–29	6.6	9.3
30–39	32.4	44.7
40–49	99.3	129.4
50–59	244.4	209.6
60–69	440.5	244.1
70–79	633.4	307.0
80 and over	879.5	422.5

*Standardized for age distribution on the basis of the standard million of England and Wales for 1901.

Cancer Mortality — United States Registration Area

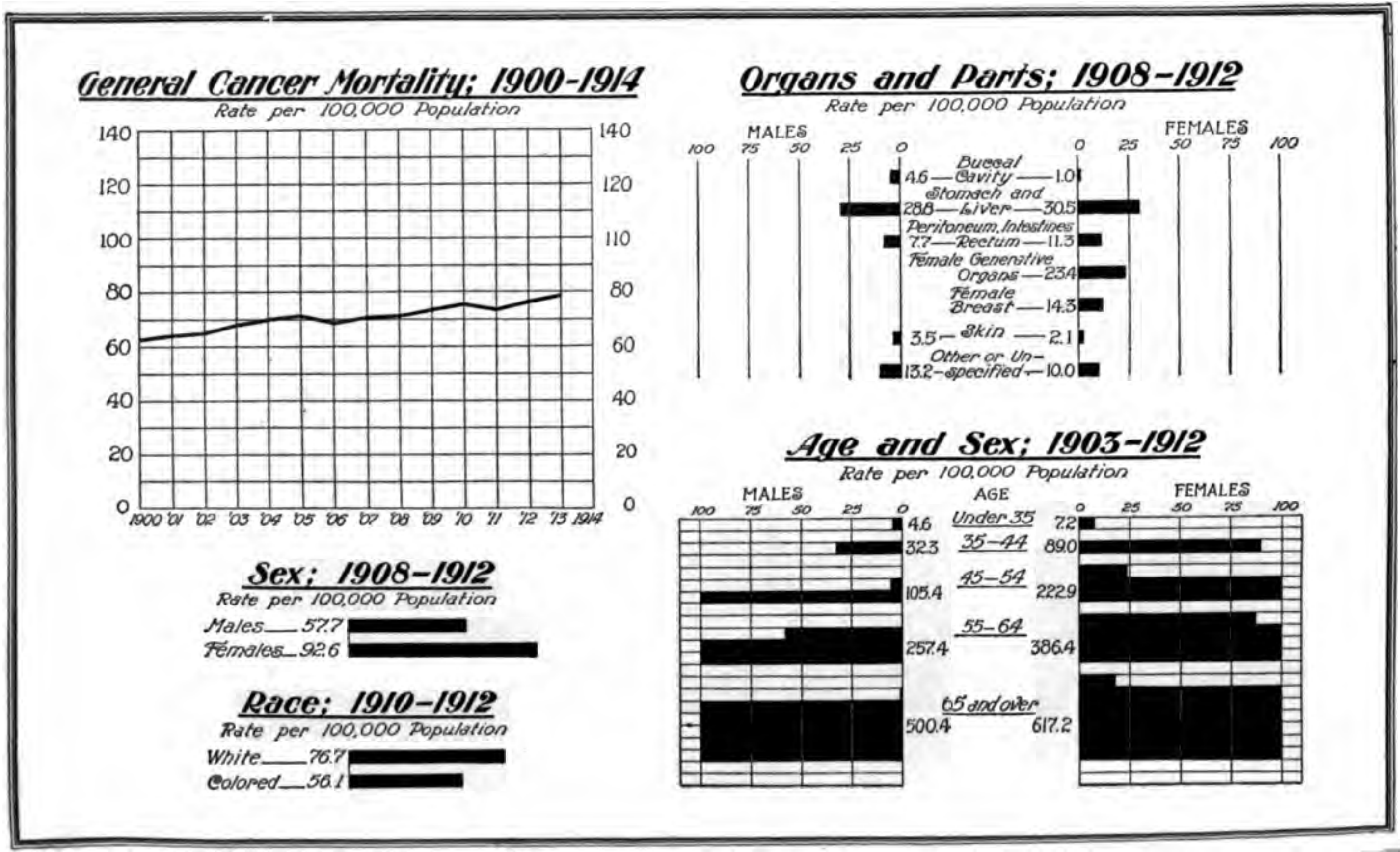


Chart No. 8. Cancer Mortality—United States Registration Area

MORTALITY FROM CANCER
1900-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Pop.
1900	30,794,273	19,381	62.9
1901	31,370,952	20,171	64.3
1902	32,029,815	20,847	65.1
1903	32,701,083	22,325	68.3
1904	33,349,137	23,395	70.2
1905	34,094,605	24,330	71.4
1906	41,983,419	29,020	69.1
1907	43,016,990	30,514	70.9
1908	46,789,913	33,465	71.5
1909	50,870,518	37,562	73.8
1910	53,843,896	41,039	76.2
1911	59,275,977	44,024	74.3
1912	60,427,247	46,531	77.0
1913	63,298,718	49,928	78.9
1914	..	..	..

MORTALITY FROM CANCER, BY SEX
1908-1912

	Total Population	Deaths from Cancer	Rate per 100,000 Pop.
Males	139,095,090	80,326	57.7
Females	132,112,347	122,295	92.6

MORTALITY FROM CANCER, BY ORGANS AND PARTS
1908-1912

Organ or Part	Males: Deaths from Cancer	Males: Rate per 100,000 Pop.	Females: Deaths from Cancer	Females: Rate per 100,000 Pop.
Buccal cavity	6,341	4.6	1,375	1.0
Stomach and liver	40,062	28.8	40,254	30.5
Periton., intest., rectum	10,716	7.7	14,928	11.3
Female generative organs	..	..	30,907	23.4
Female breast	..	..	18,884	14.3
Skin	4,857	3.5	2,738	2.1
Other or unspecified organs	18,350	13.2	13,209	10.0

MORTALITY FROM CANCER, BY RACE
1910-1912

	Total Population	Deaths from Cancer	Rate per 100,000 Pop.
White	166,329,015	127,544	76.7
Colored	7,217,991	4,050	56.1

MORTALITY FROM CANCER, BY AGE AND SEX, 1908-1912

Ages	Total Population	Deaths from Cancer	Rate per 100,000 Pop.
Males			
Under 35	152,383,432	6,955	4.6
35–44	33,235,346	10,750	32.3
45–54	23,174,947	24,431	105.4
55–64	13,726,350	35,327	257.4
65 and over	10,416,027	52,126	500.4
Females			
Under 35	148,381,116	10,719	7.2
35–44	30,097,450	26,779	89.0
45–54	20,941,618	46,669	222.9
55–64	13,042,548	50,393	386.4
65 and over	10,953,837	67,611	617.2

Cancer Mortality — England and Wales

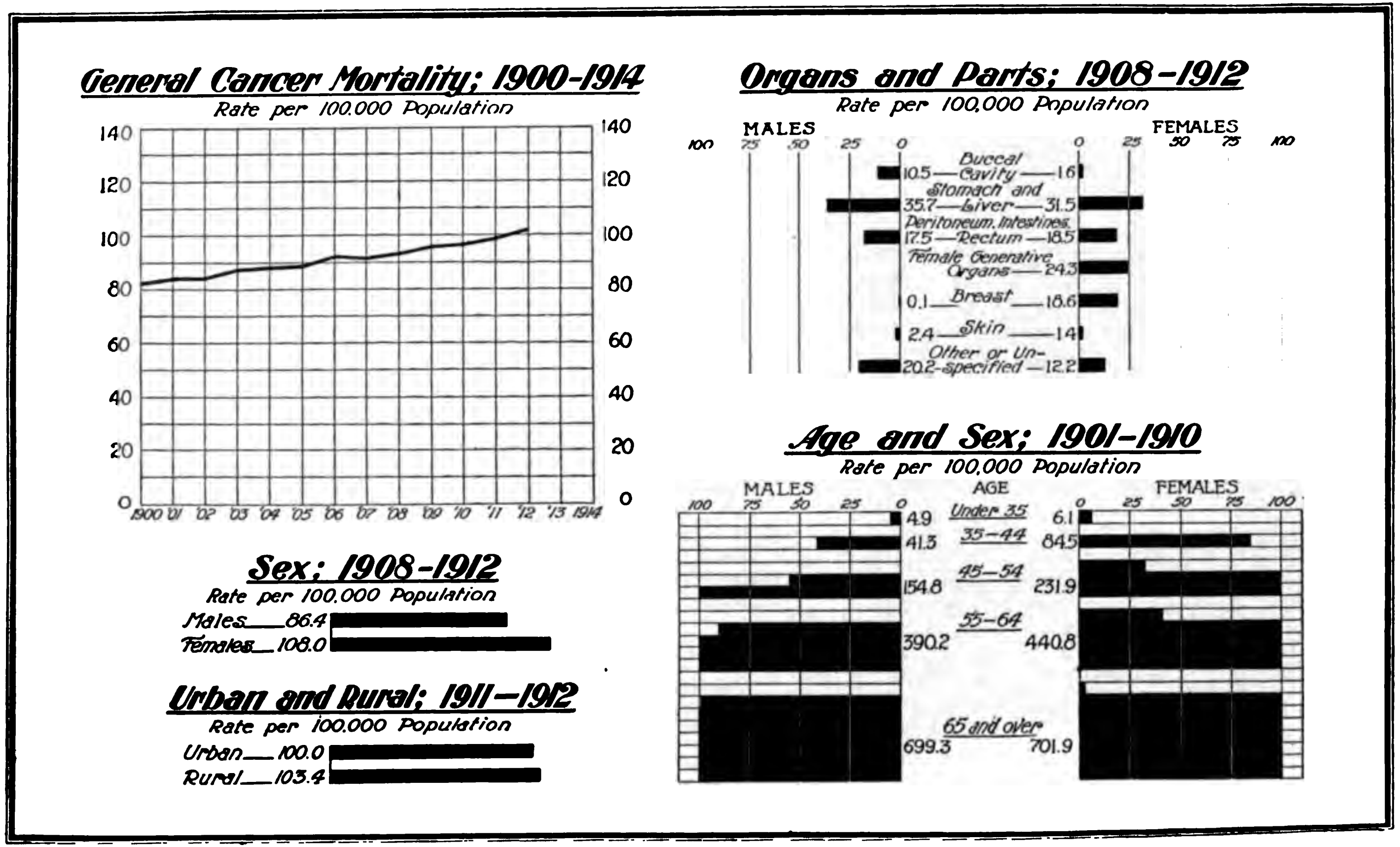


Chart No. 9. Cancer Mortality—England and Wales

MORTALITY FROM CANCER
1900-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Pop.
1900......	32,249,187	26,721	82.9
1901......	32,612,134	27,487	84.3
1902......	32,951,455	27,872	84.6
1903......	33,294,308	29,089	87.4
1904......	33,640,736	29,682	88.2
1905......	33,990,764	30,221	88.9
1906......	34,344,429	31,668	92.2
1907......	34,701,776	31,745	91.5
1908......	35,062,847	32,717	93.3
1909......	35,427,672	34,053	96.1
1910......	35,796,289	34,607	96.7
1911......	36,162,646	35,902	99.3
1912......	36,531,263	37,323	102.2
1913......	36,919,339	38,939	105.5
1914......	..	..	..

MORTALITY FROM CANCER, BY SEX
1908-1912

	Total Population	Deaths from Cancer	Rate per 100,000 Pop.
Males....................	86,564,648	74,784	86.4
Females..................	92,416,069	99,818	108.0

MORTALITY FROM CANCER, BY ORGANS AND PARTS
1908-1912

Organ or Part	Males: Deaths from Cancer	Males: Rate per 100,000 Pop.	Females: Deaths from Cancer	Females: Rate per 100,000 Pop.
Buccal cavity............	9,054	10.5	1,452	1.6
Stomach and liver........	30,922	35.7	29,121	31.5
Periton., intest., rectum...	15,113	17.5	17,051	18.5
Female generative organs..	..	..	22,428	24.3
Breast..................	118	0.1	17,189	18.6
Skin....................	2,076	2.4	1,332	1.4
Other or unspecified organs	17,501	20.2	11,245	12.2

MORTALITY FROM CANCER, URBAN AND RURAL, 1911-1912

	Total Population	Deaths from Cancer	Rate per 100,000 Pop.
Urban.....	56,757,977	56,743	100.0
Rural.....	15,935,932	16,482	103.4

MORTALITY FROM CANCER, BY AGE AND SEX, 1901-1910

Ages	Total Population	Deaths from Cancer	Rate per 100,000 Pop.
Males			
Under 35..	111,499,560	5,465	4.9
35–44.....	21,222,110	8,773	41.3
45–54.....	15,363,631	23,779	154.8
55–64.....	9,911,807	38,675	390.2
65 and over	7,309,874	51,115	699.3
Females			
Under 35..	116,420,750	7,130	6.1
35–44.....	22,735,187	19,219	84.5
45–54.....	16,603,041	38,508	231.9
55–64.....	11,189,313	49,322	440.8
65 and over	9,567,137	67,155	701.9

Cancer Mortality——Ireland

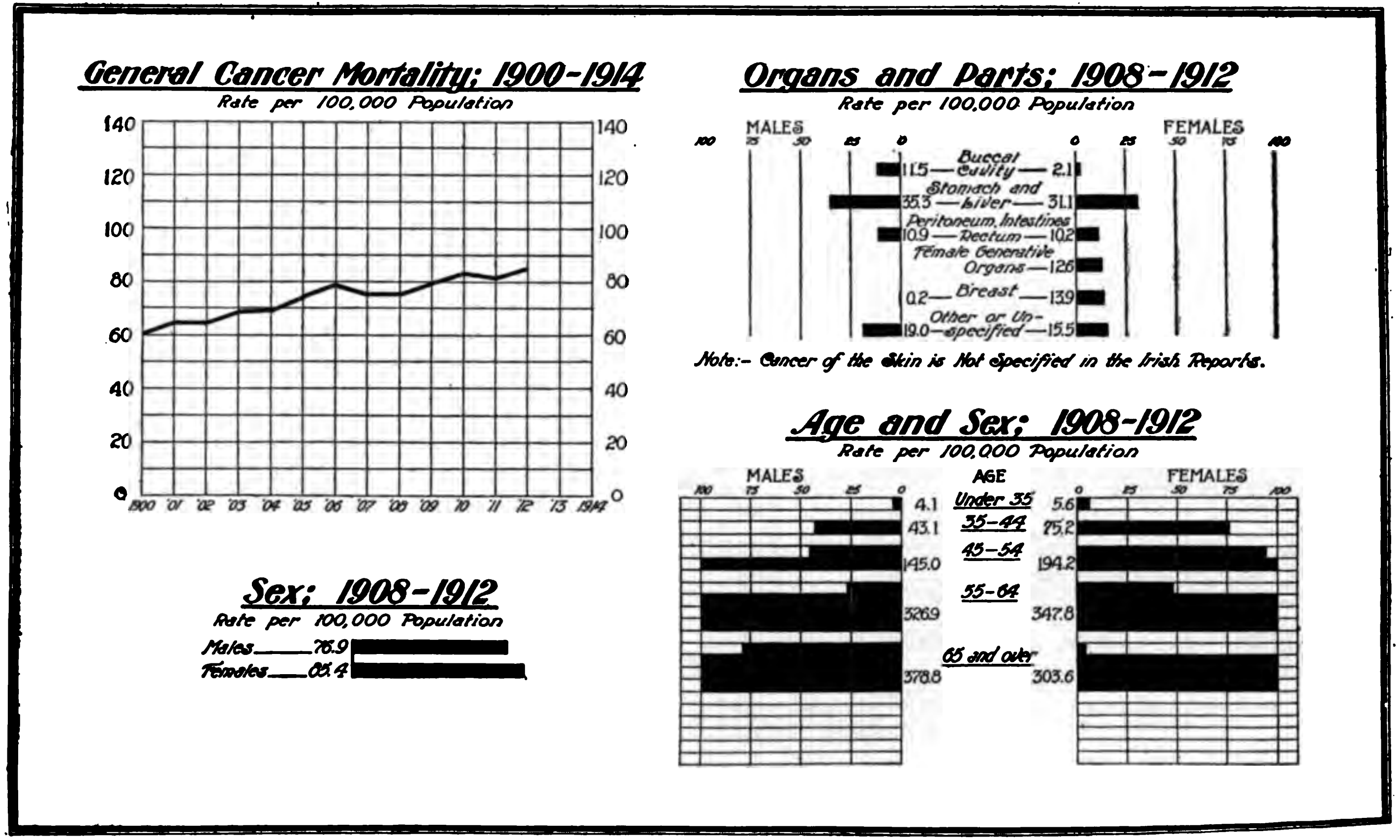


Chart No. 10. Cancer Mortality—Ireland

MORTALITY FROM CANCER 1900-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Pop.
1900......	4,468,501	2,717	60.8
1901......	4,447,085	2,893	65.1
1902......	4,434,551	2,861	64.5
1903......	4,417,757	3,048	69.0
1904......	4,408,103	3,055	69.3
1905......	4,399,308	3,291	74.8
1906......	4,397,571	3,481	79.2
1907......	4,388,451	3,338	76.1
1908......	4,384,664	3,314	75.6
1909......	4,386,601	3,502	79.8
1910......	4,385,421	3,664	83.5
1911......	4,383,608	3,582	81.7
1912......	4,384,710	3,734	85.2
1913......	..	..	..
1914......	..	..	..

MORTALITY FROM CANCER, BY SEX 1908-1912

	Total Population	Deaths from Cancer	Rate per 100,000 Pop.
Males......................	10,937,774	8,416	76.9
Females....................	10,987,230	9,380	85.4

MORTALITY FROM CANCER, BY ORGANS AND PARTS 1908-1912

Organ or Part	Males: Deaths from Cancer	Males: Rate per 100,000 Pop.	Females: Deaths from Cancer	Females: Rate per 100,000 Pop.
Buccal cavity............	1,261	11.5	230	2.1
Stomach and liver........	3,862	35.3	3,416	31.1
Periton., intest., rectum...	1,188	10.9	1,122	10.2
Female generative organs..	..	..	1,380	12.6
Breast..................	26	0.2	1,532	13.9
Other or unspecified organs	2,079	19.0	1,700	15.5

MORTALITY FROM CANCER, BY AGE AND SEX, 1908-1912

Ages	Total Population	Deaths from Cancer	Rate per 100,000 Pop.
Males			
Under 35...	6,878,657	284	4.1
35–44.....	1,363,394	588	43.1
45–54.....	988,665	1,434	145.0
55–64.....	687,111	2,246	326.9
65 and over	1,019,947	3,864	378.8
Females			
Under 35...	6,784,395	381	5.6
35–44.....	1,317,369	991	75.2
45–54.....	979,841	1,903	194.2
55–64.....	723,619	2,517	347.8
65 and over	1,182,006	3,588	303.6

Note: Cancer of the skin is not specified in the Irish reports.

Cancer Mortality —— Holland

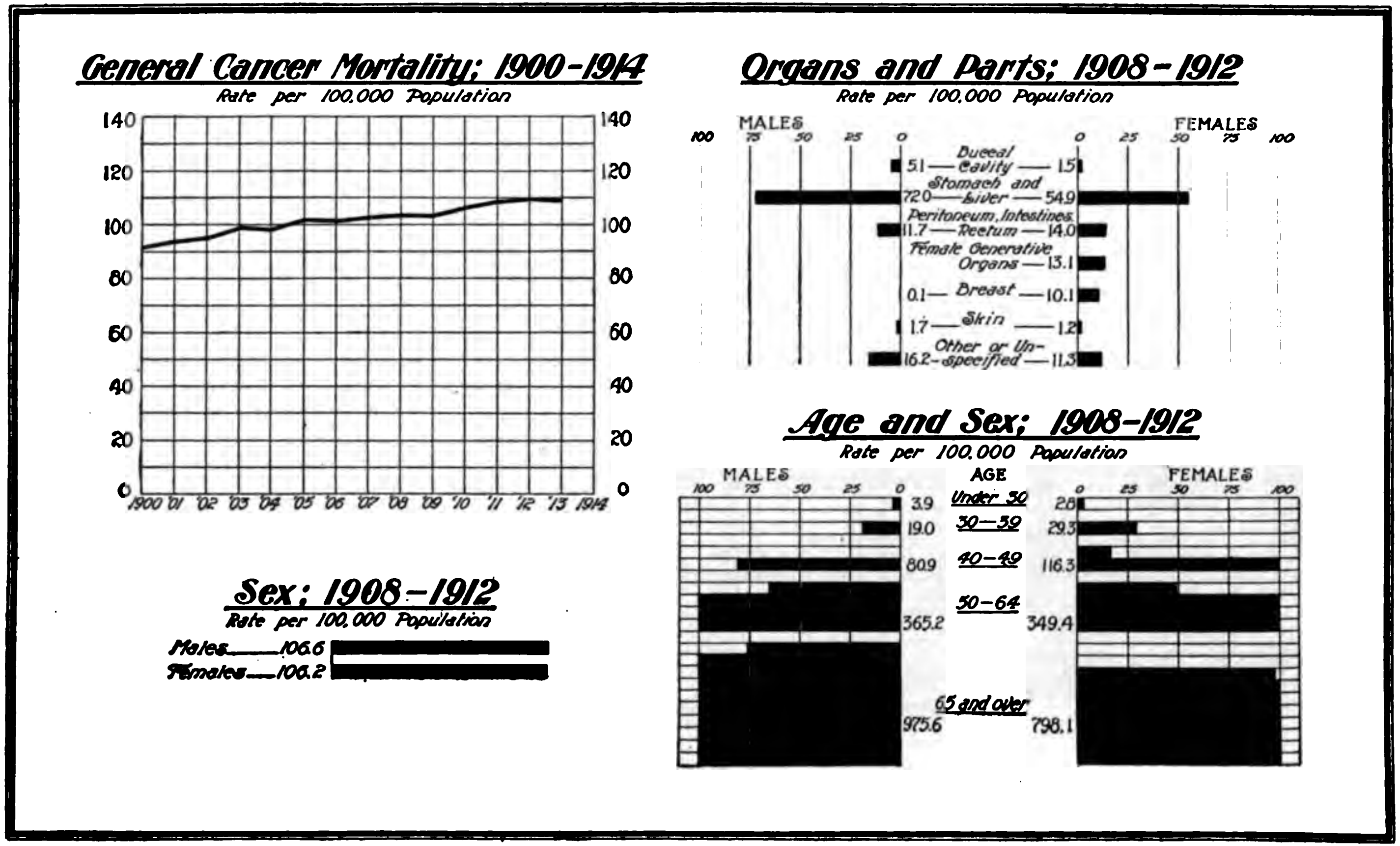


Chart No. 11. Cancer Mortality—Holland

MORTALITY FROM CANCER 1900-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Pop.
1900......	5,159,347	4,733	91.7
1901......	5,217,243	4,894	93.8
1902......	5,292,647	5,040	95.2
1903......	5,368,051	5,331	99.3
1904......	5,443,455	5,356	98.4
1905......	5,518,859	5,618	101.8
1906......	5,594,263	5,673	101.4
1907......	5,669,667	5,816	102.6
1908......	5,745,071	5,947	103.5
1909......	5,820,475	6,012	103.3
1910......	5,895,879	6,279	106.5
1911......	5,971,283	6,501	108.9
1912......	6,046,687	6,636	109.7
1913......	6,163,500	6,747	109.5
1914......	..	..	..

MORTALITY FROM CANCER, BY SEX 1908-1912

	Total Population	Deaths from Cancer	Rate per 100,000 Pop.
Males......................	14,592,300	15,560	106.6
Females....................	14,887,095	15,815	106.2

MORTALITY FROM CANCER, BY ORGANS AND PARTS 1908-1912

Organ or Part	Males: Deaths from Cancer	Males: Rate per 100,000 Pop.	Females: Deaths from Cancer	Females: Rate per 100,000 Pop.
Buccal cavity............	738	5.1	223	1.5
Stomach and liver........	10,507	72.0	8,172	54.9
Periton., intest., rectum...	1,701	11.7	2,088	14.0
Female generative organs..	..	..	1,956	13.1
Breast..................	12	0.1	1,504	10.1
Skin....................	244	1.7	185	1.2
Other or unspecified organs	2,358	16.2	1,687	11.3

MORTALITY FROM CANCER, BY AGE AND SEX, 1908-1912

Ages	Total Population	Deaths from Cancer	Rate per 100,000 Pop.
Males			
Under 30..	8,875,037	350	3.9
30–39.....	1,896,999	361	19.0
40–49.....	1,482,578	1,199	80.9
50–64.....	1,500,088	5,478	365.2
65 and over	837,598	8,172	975.6
Females			
Under 30..	8,829,536	250	2.8
30–39.....	1,987,427	583	29.3
40–49.....	1,533,371	1,784	116.3
50–64.....	1,570,589	5,487	349.4
65 and over	966,172	7,711	798.1

Cancer Mortality —— Bavaria

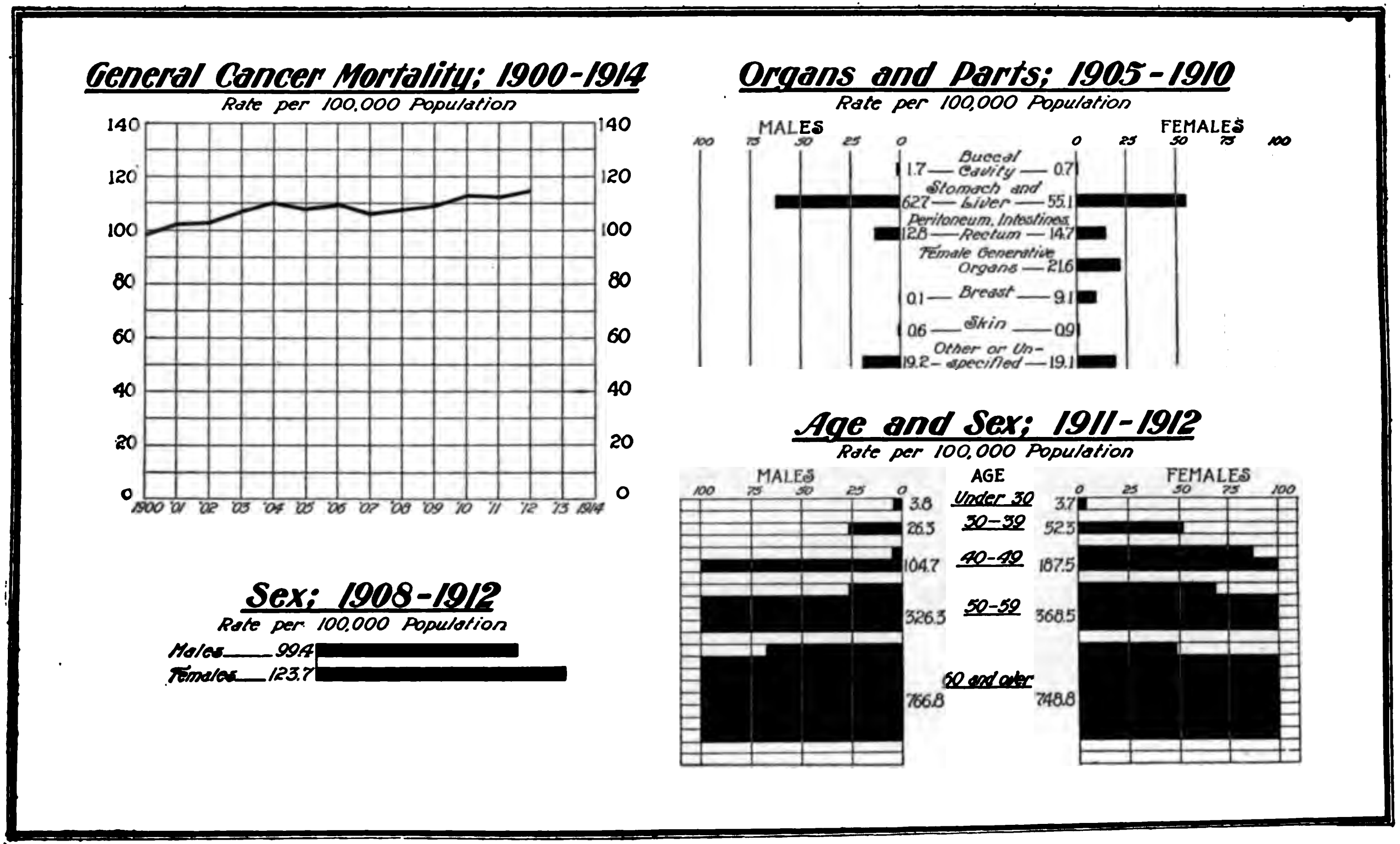


Chart No. 12. Cancer Mortality—Bavaria

MORTALITY FROM CANCER 1900-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Pop
1900	6,176,057	6,104	98.8
1901	6,245,720	6,407	102.6
1902	6,315,383	6,524	103.3
1903	6,385,046	6,859	107.4
1904	6,454,709	7,122	110.3
1905	6,524,372	7,074	108.4
1906	6,596,955	7,258	110.0
1907	6,669,539	7,104	106.5
1908	6,742,123	7,274	107.9
1909	6,814,707	7,472	109.6
1910	6,887,291	7,820	113.5
1911	6,959,875	7,828	112.5
1912	7,032,459	8,095	115.1
1913	..	..	..
1914	..	..	..

MORTALITY FROM CANCER, BY SEX 1908-1912

	Total Population	Deaths from Cancer	Rate per 100,000 Pop.
Males	16,895,998	16,798	99.4
Females	17,540,457	21,691	123.7

MORTALITY FROM CANCER, BY ORGANS AND PARTS 1905-1910

Organ or Part	Males		Females	
	Deaths from Cancer	Rate per 100,000 Pop.	Deaths from Cancer	Rate per 100,000 Pop.
Buccal cavity	335	1.7	140	0.7
Stomach and liver	12,373	62.7	11,291	55.1
Periton., intest., rectum	2,529	12.8	3,010	14.7
Female generative organs	..	..	4,434	21.6
Breast	13	0.1	1,871	9.1
Skin	124	0.6	187	0.9
Other or unspecified organs	3,786	19.2	3,909	19.1

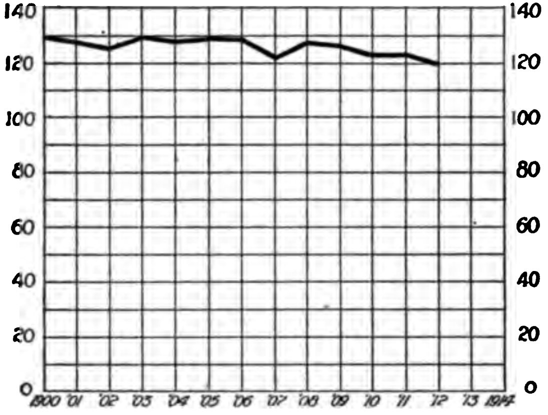
MORTALITY FROM CANCER, BY AGE AND SEX, 1911-1912

Ages	Total Population	Deaths from Cancer	Rate per 100,000 Pop.
Males			
Under 30	4,127,753	157	3.8
30–39	970,468	255	26.3
40–49	715,660	749	104.7
50–59	517,858	1,690	326.3
60 and over	536,402	4,113	766.8
Females			
Under 30	4,179,052	154	3.7
30–39	994,537	520	52.3
40–49	740,916	1,389	187.5
50–59	568,511	2,095	368.5
60 and over	641,177	4,801	748.8

Cancer Mortality —— Switzerland

General Cancer Mortality; 1900-1914

Rate per 100.000 Population



Sex; 1908-1912

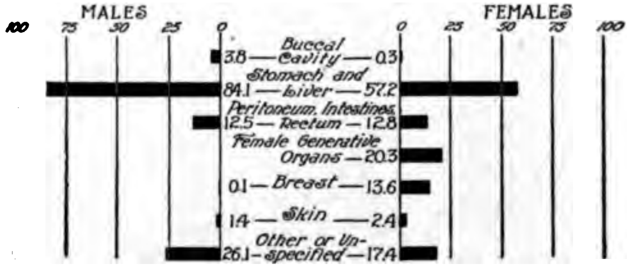
Rate per 100,000 Population

Urban and Rural; 1908-1912

Rate per 100,000 Population

Organs and Parts; 1906-1910

Rate per 100.000 Population



Age and Sex; 1901-1910

Rate per 100.000 Population

Chart No. 13. Cancer Mortality—Switzerland

MORTALITY FROM CANCER 1900-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Pop.
1900......	3,299,939	4,285	129.9
1901......	3,340,984	4,271	127.8
1902......	3,384,769	4,258	125.8
1903......	3,428,554	4,447	129.7
1904......	3,472,339	4,464	128.6
1905......	3,516,124	4,555	129.5
1906......	3,559,909	4,593	129.0
1907......	3,603,694	4,413	122.5
1908......	3,647,479	4,669	128.0
1909......	3,691,264	4,676	126.7
1910......	3,735,049	4,612	123.5
1911......	3,781,430	4,673	123.6
1912......	3,831,220	4,598	120.0
1913......	..	..	..
1914......	..	..	..

MORTALITY FROM CANCER, BY SEX 1906-1912

	Total Population	Deaths from Cancer	Rate per 100,000 Pop.
Males......................	9,156,357	11,590	126.6
Females....................	9,530,085	11,638	122.1

MORTALITY FROM CANCER, BY ORGANS AND PARTS 1906-1910

Organ or Part	Males: Deaths from Cancer	Males: Rate per 100,000 Pop.	Females: Deaths from Cancer	Females: Rate per 100,000 Pop.
Buccal cavity............	339	3.8	29	0.3
Stomach and liver.........	7,515	84.1	5,323	57.2
Periton., intest., rectum...	1,113	12.5	1,189	12.8
Female generative organs..	..	..	1,885	20.3
Breast..................	10	0.1	1,264	13.6
Skin....................	123	1.4	221	2.4
Other or unspecified organs	2,331	26.1	1,621	17.4

MORTALITY FROM CANCER, URBAN AND RURAL, 1906-1912

	Total Population	Deaths from Cancer	Rate per 100,000 Pop.
Urban.....	4,697,300	5,326	113.4
Rural.....	13,989,142	17,902	128.0

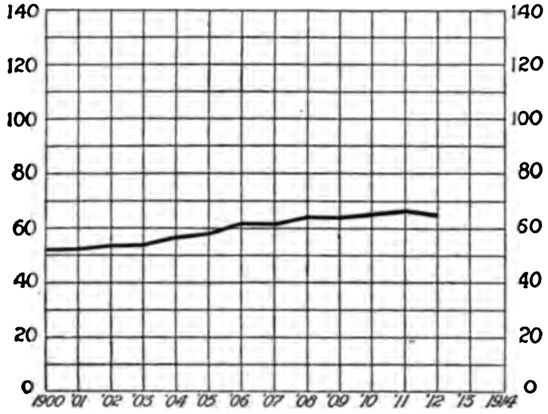
MORTALITY FROM CANCER, BY AGE AND SEX, 1901-1910

Ages	Total Population	Deaths from Cancer	Rate per 100,000 Pop.
Males			
Under 30..	10,218,004	401	3.9
30–39.....	2,404,542	543	22.6
40–49.....	1,790,838	2,253	125.8
50–59.....	1,423,308	5,377	377.8
60 and over	1,499,588	13,791	919.7
Females			
Under 30..	10,256,144	373	3.6
30–39.....	2,468,403	900	36.5
40–49.....	1,918,065	2,829	147.5
50–59.....	1,620,341	5,101	314.8
60 and over	1,780,932	13,390	751.9

Cancer Mortality —— Italy

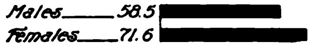
General Cancer Mortality; 1900-1914

Rate per 100,000 Population



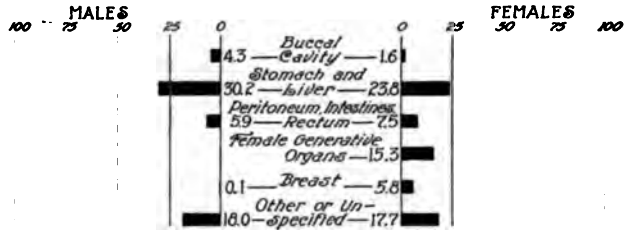
Sex; 1908-1912

Rate per 100,000 Population



Organs and Parts; 1908-1912

Rate per 100,000 Population



Note: Cancer of the Skin is not specified in the Italian reports

Age and Sex; 1908-1912

Rate per 100,000 Population

Chart No. 14. Cancer Mortality—Italy

MORTALITY FROM CANCER 1900-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Pop
1900	32,346,366	16,873	52.2
1901	32,533,337	17,141	52.7
1902	32,699,510	17,634	53.9
1903	32,839,509	17,774	54.1
1904	33,016,234	18,860	57.1
1905	33,193,289	19,348	58.3
1906	33,325,098	20,653	62.0
1907	33,514,702	20,668	61.7
1908	33,826,688	21,828	64.5
1909	34,077,068	21,871	64.2
1910	34,376,609	22,555	65.6
1911	34,688,814	23,172	66.8
1912	35,026,486	22,661	64.7
1913	..	..	..
1914	..	..	..

MORTALITY FROM CANCER, BY SEX 1908-1912

	Total Population	Deaths from Cancer	Rate per 100,000 Pop.
Males	84,409,281	49,375	58.5
Females	87,586,384	62,712	71.6

MORTALITY FROM CANCER, BY ORGANS AND PARTS 1908-1912

Organ or Part	Males: Deaths from Cancer	Males: Rate per 100,000 Pop	Females: Deaths from Cancer	Females: Rate per 100,000 Pop.
Buccal cavity	3,669	4.3	1,358	1.6
Stomach and liver	25,452	30.2	20,882	23.8
Periton., intest., rectum	4,986	5.9	6,529	7.5
Female generative organs	..	..	13,358	15.3
Breast	86	0.1	5,067	5.8
Other or unspecified organs	15,182	18.0	15,518	17.7

MORTALITY FROM CANCER, BY AGE AND SEX, 1908-1912

Ages	Total Population	Deaths from Cancer	Rate per 100,000 Pop.
Males			
Under 35	54,923,431	2,676	4.9
35–44	9,000,562	2,863	31.8
45–54	8,185,168	7,637	93.3
55–64	6,516,396	14,444	221.7
65 and over	5,500,109	21,708	394.7
Unknown	283,615	47	..
Females			
Under 35	56,635,108	3,278	5.8
35–44	9,749,240	5,730	58.8
45–54	8,532,666	12,554	147.1
55–64	6,722,255	17,165	255.3
65 and over	5,634,432	23,911	424.4
Unknown	312,683	74	..

NOTE: Cancer of the skin is not specified in the Italian reports.

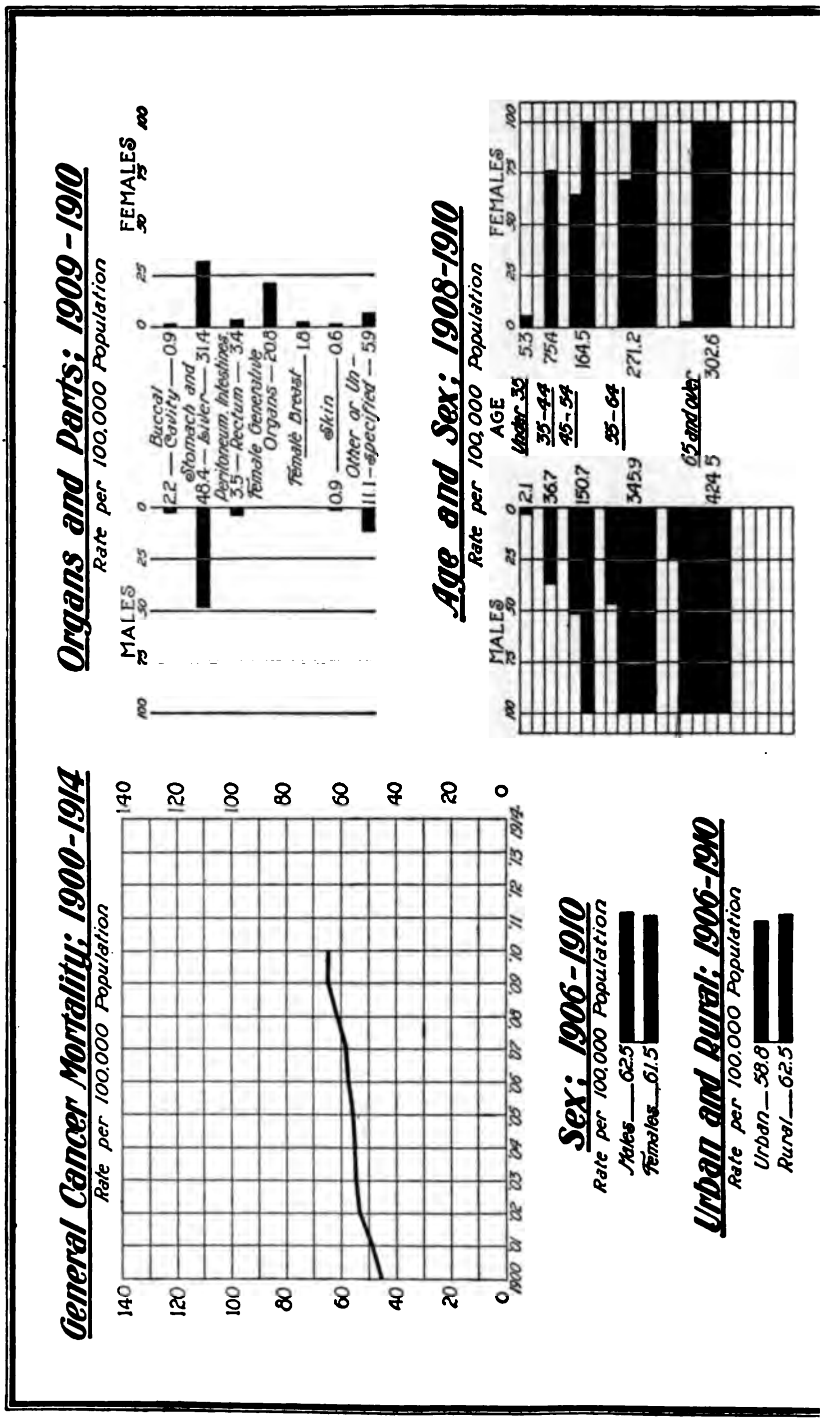

Cancer Mortality ——— Japan
General Cancer Mortality; 1900-1914
Rate per 100,000 Population
140 120 100 80 60 40 20 0
1900 '01 '02 '03 '04 '05 '06 '07 '08 '09 '10 '11 '12 '13 1914
Organs and Parts; 1909-1910
Rate per 100,000 Population
MALES
FEMALES
2.2 — Buccal — Cavity — 0.9
48.4 — Stomach and Liver — 31.4
3.5 — Peritoneum, Intestines, Rectum — 3.4
Female Generative Organs — 20.8
Female Breast — 1.8
0.9 — Skin — 0.6
11.1 — Other or Un-specified — 5.9
Age and Sex; 1908-1910
Rate per 100,000 Population
MALES
AGE
FEMALES
2.1 Under 35 5.3
36.7 35-44 75.4
150.7 45-54 164.5
345.9 55-64 271.2
424.5 65 and over 302.6
Sex; 1906-1910
Rate per 100,000 Population
Males 62.5
Females 61.5
Urban and Rural; 1906-1910
Rate per 100,000 Population
Urban 58.8
Rural 62.5

Chart No. 15. Cancer Mortality—Japan

MORTALITY FROM CANCER
1900-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Pop
1900	44,577,790	20,334	45.6
1901	45,152,050	22,149	49.1
1902	45,726,310	24,598	53.8
1903	46,300,570	25,550	55.2
1904	46,846,690	25,993	55.5
1905	47,392,810	26,668	56.3
1906	47,938,930	27,863	58.1
1907	48,492,085	28,451	58.7
1908	49,045,240	30,440	62.1
1909	49,591,360	32,543	65.6
1910	50,137,480	32,741	65.3
1911	50,683,600	33,888	66.9
1912	..	..	..
1913	..	..	..
1914	..	..	..

MORTALITY FROM CANCER, BY SEX
1906-1910

	Total Population	Deaths from Cancer	Rate per 100,000 Pop.
Males	123,552,843	77,230	62.5
Females	121,652,252	74,808	61.5

MORTALITY FROM CANCER, BY ORGANS AND PARTS
1909-1910

Organ or Part	Males: Deaths from Cancer	Males: Rate per 100,000 Pop.	Females: Deaths from Cancer	Females: Rate per 100,000 Pop.
Buccal cavity	1,098	2.2	429	0.9
Stomach and liver	24,331	48.4	15,530	31.4
Periton., intest., rectum	1,777	3.5	1,684	3.4
Female generative organs	..	..	10,322	20.8
Breast	..	..	878	1.8
Skin	444	0.9	290	0.6
Other or unspecified organs	5,556	11.1	2,945	5.9

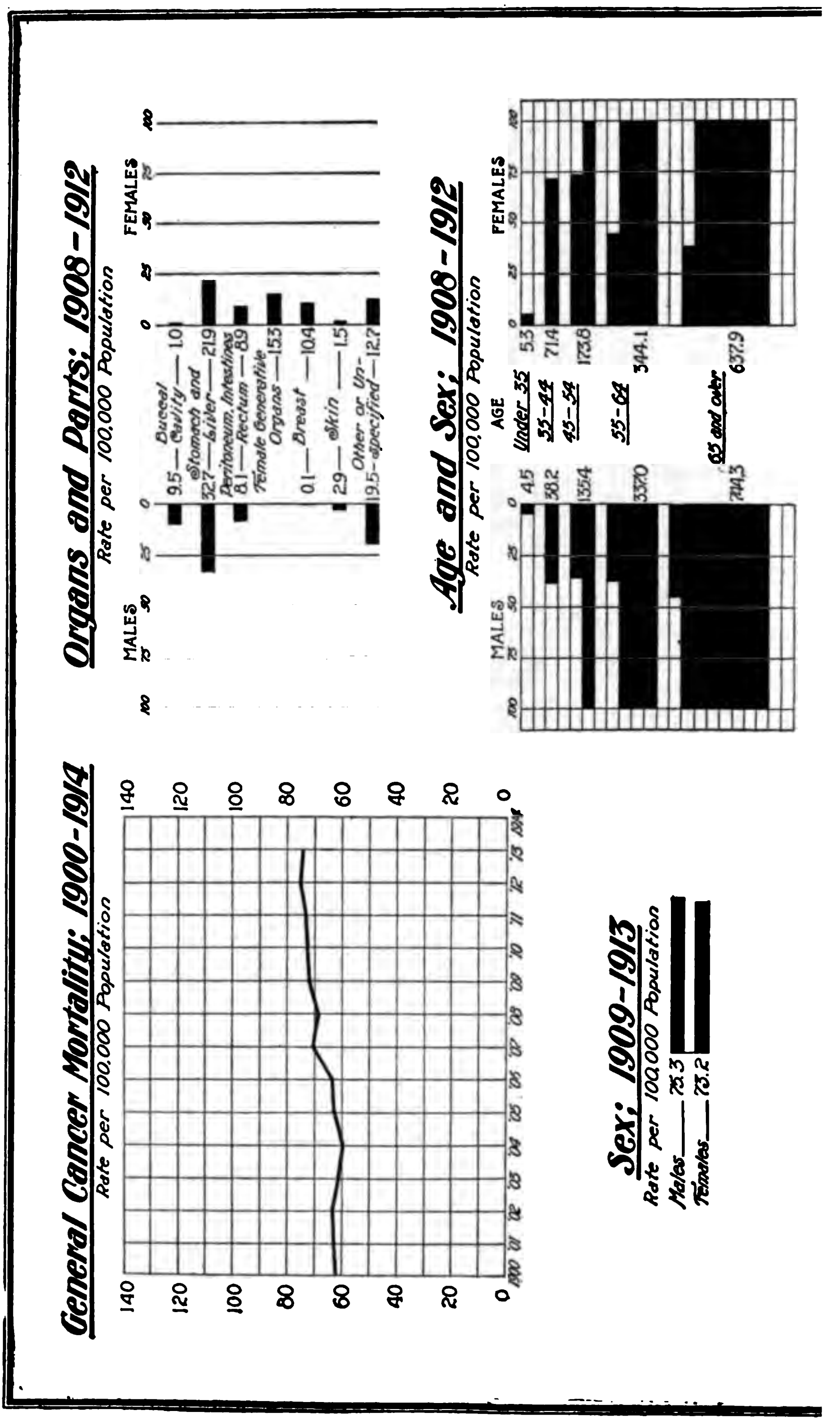
MORTALITY FROM CANCER, URBAN AND RURAL, 1906-1910

	Total Population	Deaths from Cancer	Rate per 100,000 Pop
Urban*	33,603,490	19,744	58.8
Rural	211,601,605	132,294	62.5

*Cities with more than 50,000 inhabitants

MORTALITY FROM CANCER, BY AGE AND SEX, 1908-1910

Ages	Total Population	Deaths from Cancer	Rate per 100,000 Pop.
Males			
Under 35	50,339,610	1,048	2.1
35-44	8,729,629	3,202	36.7
45-54	6,856,318	10,333	150.7
55-64	5,417,615	18,737	345.9
65 and over	3,589,264	15,238	424.5
Females			
Under 35	49,296,681	2,604	5.3
35-44	8,336,722	6,288	75.4
45-54	6,564,522	10,797	164.5
55-64	5,419,977	14,698	271.2
65 and over	4,223,742	12,779	302.6



Cancer Mortality — Commonwealth of Australia
General Cancer Mortality; 1900-1914
Rate per 100,000 Population
Organs and Parts; 1908-1912
Rate per 100,000 Population
MALES
FEMALES
9.5 — Buccal Cavity — 1.0
32.7 — Stomach and Liver — 21.9
8.1 — Peritoneum, Intestines Rectum — 8.9
Female Generative Organs — 15.3
0.1 — Breast — 10.4
2.9 — Skin — 1.5
19.5 — Other or Un-specified — 12.7
Age and Sex; 1908-1912
Rate per 100,000 Population
AGE
4.5 Under 35 5.3
38.2 35-44 71.4
135.4 45-54 173.8
337.0 55-64 344.1
714.3 65 and over 637.9
Sex; 1909-1913
Rate per 100,000 Population
Males 73.3
Females 73.2

Chart No. 16. Cancer Mortality—Commonwealth of Australia

MORTALITY FROM CANCER 1900-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Pop.
1900	3,740,665	2,341	62.6
1901	3,790,710	2,401	63.3
1902	3,847,998	2,467	64.1
1903	3,893,329	2,396	61.5
1904	3,942,730	2,371	60.1
1905	4,001,117	2,539	63.5
1906	4,060,324	2,608	64.2
1907	4,123,729	2,940	71.3
1908	4,194,410	2,921	69.6
1909	4,274,617	3,112	72.8
1910	4,370,185	3,205	73.3
1911	4,490,366	3,321	74.0
1912	4,644,852	3,537	76.1
1913	4,803,661	3,603	75.0
1914	..	..	..

MORTALITY FROM CANCER, BY SEX 1909-1913

	Total Population	Deaths from Cancer	Rate per 100,000 Pop.
Males	11,739,575	8,844	75.3
Females	10,844,106	7,934	73.2

MORTALITY FROM CANCER, BY ORGANS AND PARTS 1908-1912

Organ or Part	Males: Deaths from Cancer	Males: Rate per 100,000 Pop.	Females: Deaths from Cancer	Females: Rate per 100,000 Pop.
Buccal cavity	1,102	9.5	103	1.0
Stomach and liver	3,789	32.7	2,346	21.9
Periton., intest., rectum	933	8.1	953	8.9
Female generative organs	..	..	1,635	15.3
Breast	11	0.1	1,117	10.4
Skin	335	2.9	157	1.5
Other or unspecified organs	2,255	19.5	1,360	12.7

MORTALITY FROM CANCER, BY AGE AND SEX, 1908-1912

Ages	Total Population	Deaths from Cancer	Rate per 100,000 Pop.
Males			
Under 35	7,744,117	348	4.5
35–44	1,493,484	571	38.2
45–54	1,213,311	1,643	135.4
55–64	621,706	2,095	337.0
65 and over	504,774	3,757	744.3
Females			
Under 35	7,447,090	398	5.3
35–44	1,327,543	948	71.4
45–54	971,034	1,688	173.8
55–64	507,464	1,746	344.1
65 and over	452,864	2,889	637.9

Cancer Mortality——Uruguay

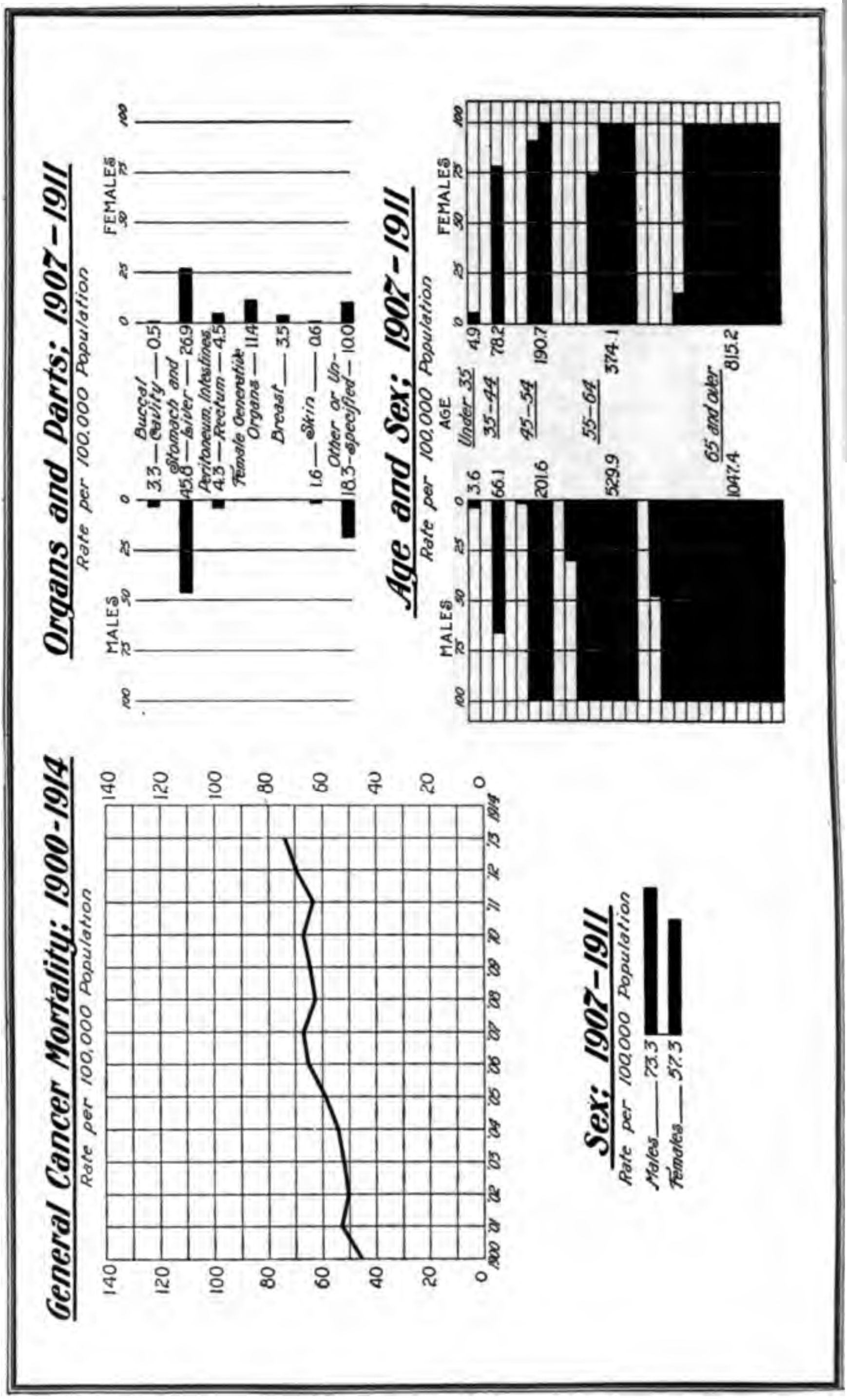


Chart No. 17. Cancer Mortality—Uruguay

MORTALITY FROM CANCER
1900-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Pop.
1900......	915,647	423	46.2
1901......	931,527	495	53.1
1902......	947,407	481	50.8
1903......	963,287	501	52.0
1904......	979,166	531	54.2
1905......	995,046	587	59.0
1906......	1,010,926	667	66.0
1907......	1,026,806	695	67.7
1908......	1,042,686	662	63.5
1909......	1,080,070	704	65.2
1910......	1,117,454	757	67.7
1911......	1,154,838	732	63.4
1912......	1,192,222	838	70.3
1913......	1,229,606	903	73.4
1914......	..	..	..

MORTALITY FROM CANCER, BY SEX
1907-1911

	Total Population	Deaths from Cancer	Rate per 100,000 Pop.
Males......................	2,758,641	2,023	73.3
Females....................	2,663,213	1,527	57.3

MORTALITY FROM CANCER BY ORGANS AND PARTS
1907-1911

Organ or Part	Males: Deaths from Cancer	Males: Rate per 100,000 Pop.	Females: Deaths from Cancer	Females: Rate per 100,000 Pop.
Buccal cavity............	92	3.3	12	0.5
Stomach and liver........	1,264	45.8	717	26.9
Periton., intest., rectum...	120	4.3	119	4.5
Female generative organs..	..	..	304	11.4
Breast.................	..	..	93	3.5
Skin...................	43	1.6	15	0.6
Other or unspecified organs	504	18.3	267	10.0

MORTALITY FROM CANCER, BY AGE AND SEX, 1907-1911

Ages	Total Population	Deaths from Cancer	Rate per 100,000 Pop.
Males			
Under 35..	2,089,533	76	3.6
35–44.....	275,368	182	66.1
45–54.....	200,857	405	201.6
55–64.....	118,704	629	529.9
65 and over	69,600	729	1,047.4
Unknown..	4,579	2	..
Females			
Under 35..	2,080,955	101	4.9
35–44.....	248,025	194	78.2
45–54.....	166,717	318	190.7
55–64.....	95,956	359	374.1
65 and over	67,832	553	815.2
Unknown..	3,728	2	..

Cancer Mortality——New York City

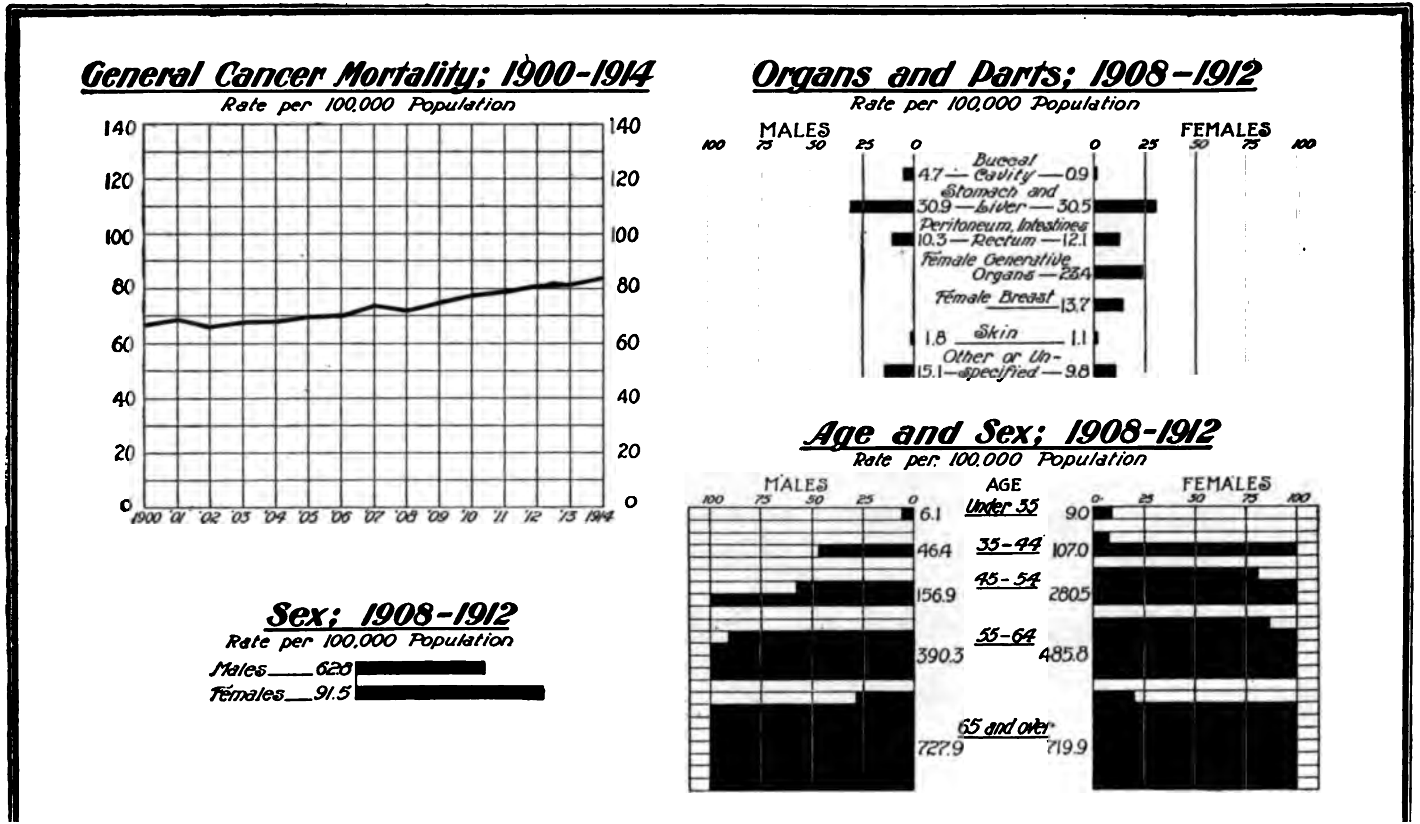


Chart No. 18. Cancer Mortality—New York City

MORTALITY FROM CANCER 1900-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Pop.
1900......	3,437,202	2,291	66.7
1901......	3,570,169	2,463	69.0
1902......	3,703,136	2,450	66.2
1903......	3,836,103	2,608	68.0
1904......	3,969,071	2,709	68.3
1905......	4,102,039	2,875	70.1
1906......	4,235,007	3,005	71.0
1907......	4,367,976	3,227	73.9
1908......	4,500,945	3,243	72.1
1900......	4,633,914	3,488	75.3
1910......	4,766,883	3,710	77.8
1911......	4,899,852	3,873	79.0
1912......	5,032,821	4,071	80.9
1913......	5,165,790	4,223	81.7
1914......	5,298,759	4,467	84.3

MORTALITY FROM CANCER, BY SEX 1908-1912

	Total Population	Deaths from Cancer	Rate per 100,000 Pop.
Males......................	11,912,410	7,477	62.8
Females....................	11,922,005	10,908	91.5

MORTALITY FROM CANCER, BY ORGANS AND PARTS 1908-1912

Organ or Part	Males: Deaths from Cancer	Males: Rate per 100,000 Pop.	Females: Deaths from Cancer	Females: Rate per 100,000 Pop.
Buccal cavity............	562	4.7	104	0.9
Stomach and liver........	3,684	30.9	3,637	30.5
Periton., intest., rectum...	1,227	10.3	1,447	12.1
Female generative organs..	..	..	2,784	23.4
Female breast...........	..	..	1,636	13.7
Skin....................	211	1.8	134	1.1
Other or unspecified organs	1,793	15.1	1,166	9.8

MORTALITY FROM CANCER, BY AGE AND SEX, 1908-1912

Ages	Population	Deaths from Cancer	Rate per 100,000 Pop.
Males			
Under 35..	8,148,088	501	6.1
35-44.....	1,793,413	832	46.4
45-54.....	1,107,019	1,737	156.9
55-64.....	557,264	2,175	390.3
65 and over	306,626	2,232	727.9
Females			
Under 35..	8,269,460	746	9.0
35-44.....	1,672,180	1,790	107.0
45-54.....	1,031,345	2,893	280.5
55-64.....	578,007	2,808	485.8
65 and over	371,013	2,671	719.9

Cancer Mortality —— London

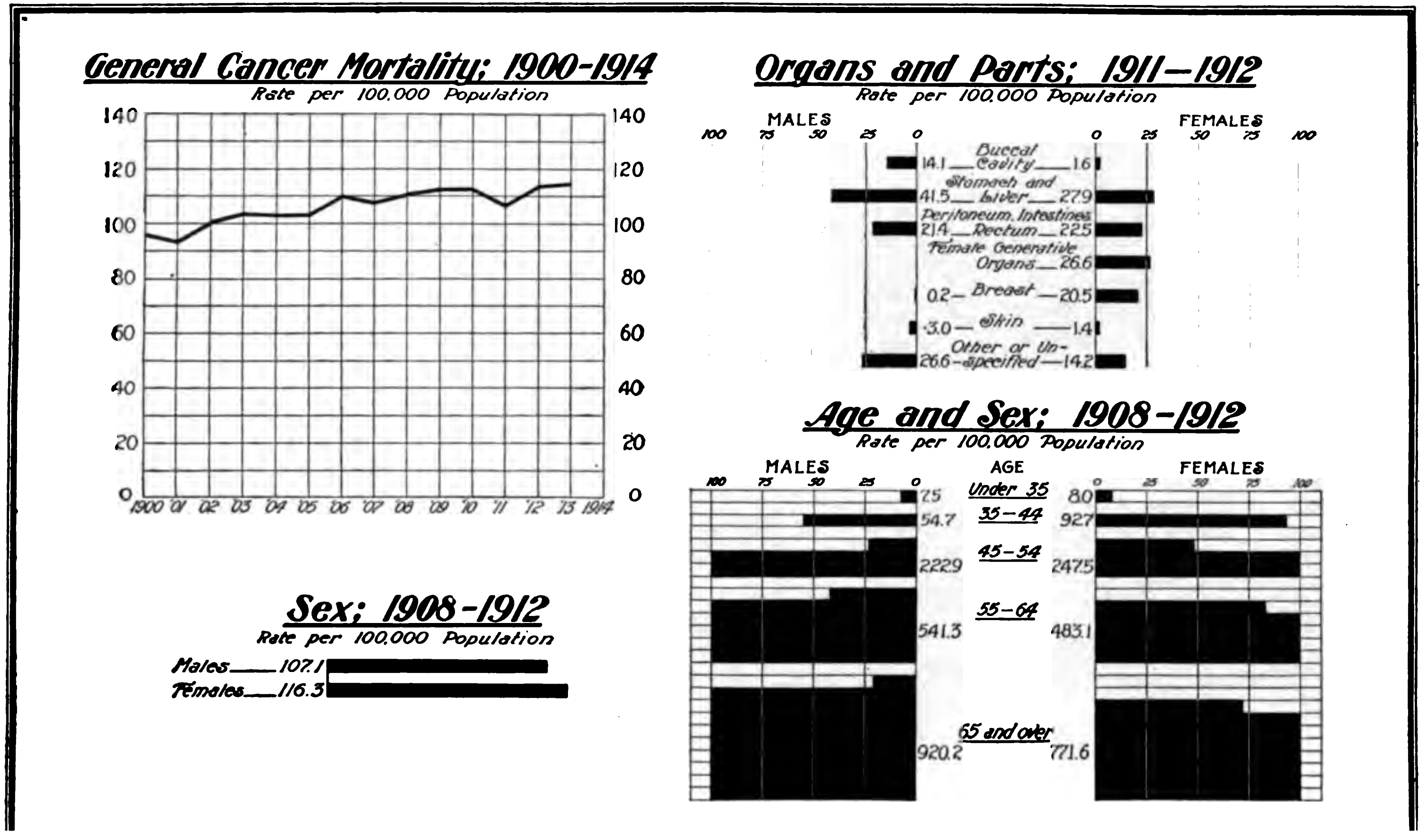


Chart No. 19 Cancer Mortality—London

MORTALITY FROM CANCER 1900-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Pop.
1900	4,515,375	4,348	96.3
1901	4,546,209	4,260	93.7
1902	4,544,878	4,591	101.0
1903	4,543,547	4,716	103.8
1904	4,542,216	4,677	103.0
1905	4,540,885	4,691	103.3
1906	4,539,554	5,001	110.2
1907	4,538,223	4,899	107.9
1908	4,536,892	5,045	111.2
1909	4,535,561	5,128	113.1
1910	4,534,230	5,115	112.8
1911	4,532,899	4,858	107.2
1912	4,531,572	5,176	114.2
1913	4,530,245	5,260	114.9
1914	..	..	..

MORTALITY FROM CANCER, BY SEX 1908-1912

	Total Population	Deaths from Cancer	Rate per 100,000 Pop.
Males	10,634,182	11,391	107.1
Females	11,979,708	13,931	116.3

MORTALITY FROM CANCER. BY ORGANS AND PARTS 1911-1912

Organ or Part	Males: Deaths from Cancer	Males: Rate per 100,000 Pop.	Females: Deaths from Cancer	Females: Rate per 100,000 Pop
Buccal cavity	600	14.1	78	1.6
Stomach and liver	1,765	41.5	1,337	27.9
Periton., intest., rectum	909	21.4	1,077	22.5
Female generative organs	..	..	1,275	26.6
Breast	7	0.2	983	20.5
Skin	126	3.0	66	1.4
Other or unspecified organs	1,130	26.6	681	14.2

MORTALITY FROM CANCER, BY AGE AND SEX, 1908-1912

Ages	Total Population	Deaths from Cancer	Rate per 100,000 Pop.
Males			
Under 35	6,988,784	527	7.5
35–44	1,469,644	804	54.7
45–54	1,070,862	2,387	222.9
55–64	658,256	3,563	541.3
65 and over	446,636	4,110	920.2
Females			
Under 35	7,682,587	615	8.0
35–44	1,666,377	1,548	92.7
45–54	1,205,159	2,983	247.5
55–64	767,899	3,710	483.1
65 and over	657,686	5,075	771.6

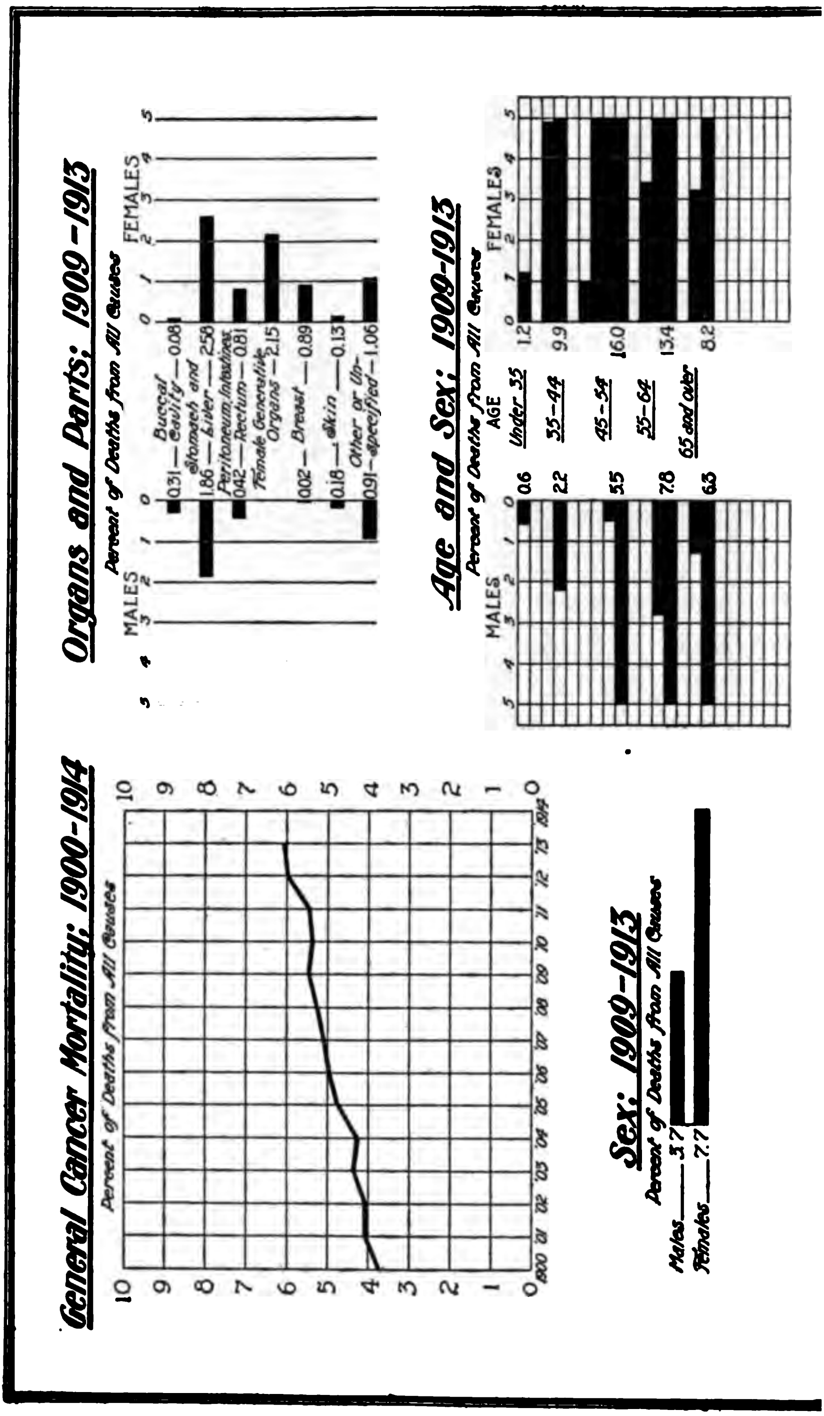

Cancer Mortality — Prudential Industrial Experience
General Cancer Mortality; 1900-1914
Percent of Deaths from All Causes
Organs and Parts; 1909-1913
Percent of Deaths from All Causes
MALES
FEMALES
0.31 — Buccal Cavity — 0.08
1.86 — Stomach and Liver — 2.58
0.42 — Peritoneum, Intestines, Rectum — 0.81
Female Generative Organs — 2.15
0.02 — Breast — 0.89
0.18 — Skin — 0.13
0.91 — Other or Unspecified — 1.06
Age and Sex; 1909-1913
Percent of Deaths from All Causes
AGE
0.6 Under 35 1.2
2.2 35-44 9.9
5.5 45-54 16.0
7.8 55-64 13.4
6.3 65 and over 8.2
Sex; 1909-1913
Percent of Deaths from All Causes
Males 3.7
Females 7.7

Chart No. 20. Cancer Mortality—Prudential Industrial Experience

PROPORTIONATE MORTALITY FROM CANCER, 1900-1914

Males and Females

Year	Deaths from All Causes	Deaths from Cancer	Per Cent.
1900......	42,433	1,616	3.8
1901......	46,076	1,877	4.1
1902......	47,870	1,986	4.1
1903......	51,896	2,304	4.4
1904......	58,211	2,530	4.3
1905......	57,665	2,766	4.8
1906......	62,210	3,110	5.0
1907......	66,174	3,375	5.1
1908......	64,277	3,414	5.3
1909......	67,390	3,684	5.5
1910......	76,916	4,144	5.4
1911......	78,216	4,324	5.5
1912......	80,165	4,770	6.0
1913......	86,806	5,285	6.1
1914......	..	..	..

MORTALITY FROM CANCER, BY SEX 1909-1913

	Deaths from All Causes	Deaths from Cancer	Per Cent.
Males......................	195,133	7,212	3.7
Females....................	194,360	14,995	7.7

MORTALITY FROM CANCER, BY ORGANS AND PARTS 1909-1913

Organ or Part	Males: Deaths from Cancer	Males: Per Cent. of All Causes	Females: Deaths from Cancer	Females: Per Cent. of All Causes
Buccal cavity............	603	0.31	157	0.08
Stomach and liver........	3,628	1.86	5,022	2.58
Periton., intest., rectum...	819	0.42	1,576	0.81
Female generative organs..	..	..	4,180	2.15
Breast..................	36	0.02	1,737	0.89
Skin....................	346	0.18	261	0.13
Other or unspecified organs	1,780	0.91	2,062	1.06

MORTALITY FROM CANCER, BY AGE AND SEX, 1909-1913

Ages	Deaths from All Causes	Deaths from Cancer	Per Cent.
Males			
Under 35..	75,492	425	0.6
35–44.....	24,626	544	2.2
45–54.....	26,298	1,435	5.5
55–64.....	30,689	2,407	7.8
65 and over	38,028	2,401	6.3
Females			
Under 35..	69,933	850	1.2
35–44.....	21,677	2,152	9.9
45–54.....	24,600	3,934	16.0
55–64.....	31,678	4,256	13.4
65 and over	46,472	3,803	8.2

Cancer Fatality Rate—Johns Hopkins Hospital, 1902–1913

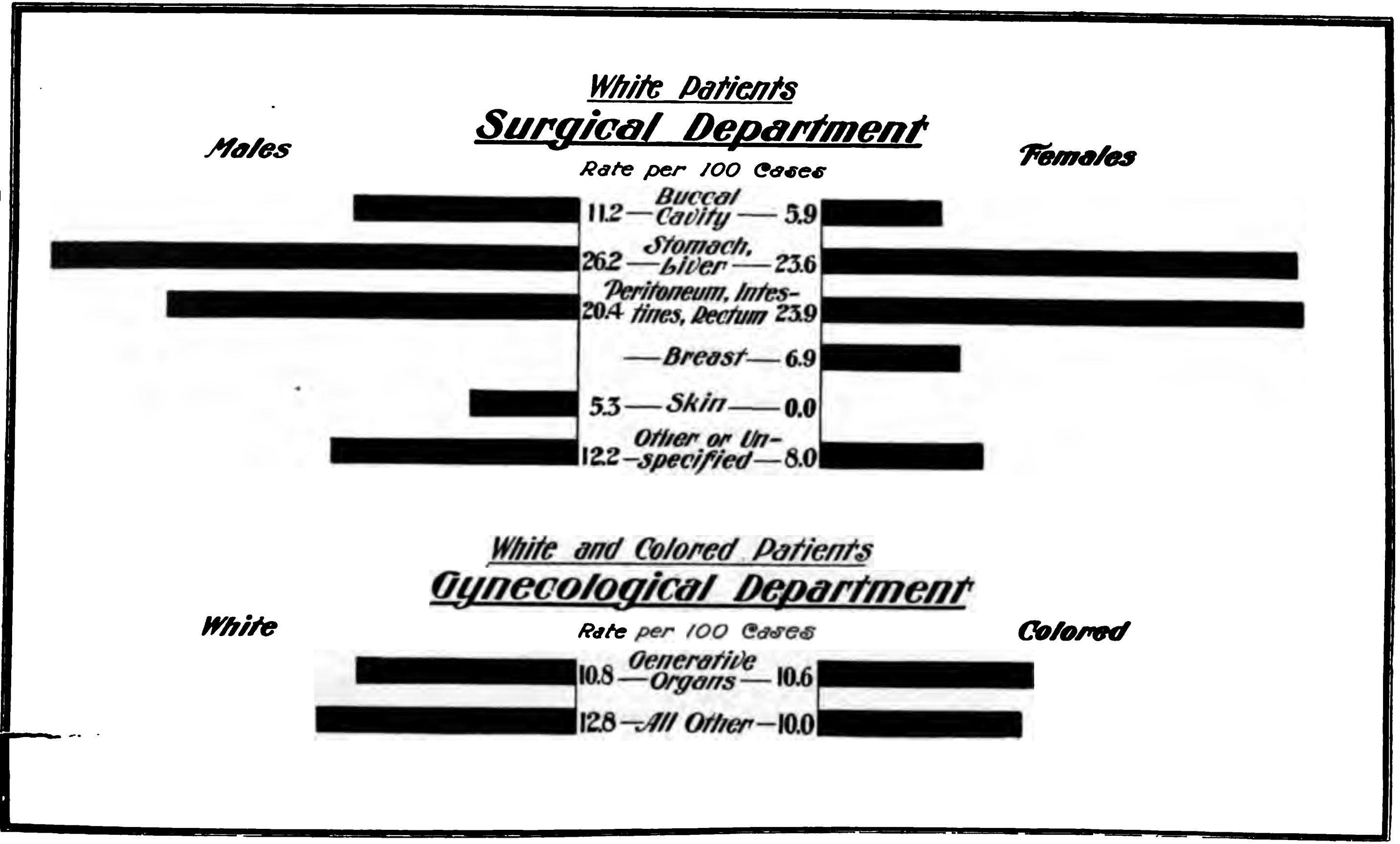


Chart No. 21. Cancer Fatality Rate—Johns Hopkins Hospital, 1902-1913

SURGICAL DEPARTMENT, WHITE PATIENTS

	MALES			FEMALES		
	Cases	Deaths	Per Cent.	Cases	Deaths	Per Cent.
Buccal cavity	161	18	11.2	17	1	5.9
Stomach and liver	130	34	26.2	72	17	23.6
Peritoneum, intestines and rectum	108	22	20.4	46	11	23.9
Breast	..	..	..	291	20	6.9
Skin	76	4	5.3	13	..	0.0
Other organs	557	68	12.2	137	11	8.0

GYNECOLOGICAL DEPARTMENT

	WHITE			COLORED		
	Cases	Deaths	Per Cent.	Cases	Deaths	Per Cent.
Generative organs	380	41	10.8	104	11	10.6
Other organs	78	10	12.8	30	3	10.0

APPENDIX

A

TUMOR CLASSIFICATIONS

Table		Page
1	Walshe's Classification, 1844	268
2	Pembrey and Ritchie's Classification, 1913	269
3	Hatch's Classification, 1904	271
4	Charles Powell White's Classification, 1913	272
5	Gould and Pyle's Classification, 1914	273
6	Bertillon International Classification of Tumors	276
7	Bertillon International Classification of Diseases Allied to Tumors	281
8	Imperial Cancer Research Fund Classification, 1903	283

APPENDIX A

Table 1
Walshe's Classification, 1844

Family	Class	Order	Genus	Species	Varieties	Synonyms of the Species
Adventitious Formations	Heterologous Formations	Tissues	Cancer or Carcinoma	Encephaloid	Common vascular sarcoma, Mammary sarcoma? } ABERNETHY. Solanoid. RECAMIER, Zang. Nephroid. Idem. Napiform. Idem. Carcinoma fasciculatum vel hyalinum. MUELLER. Fungus hæmatodes. HEY. Hæmatode Cancer. AUCT.GALL.	Spongy or ossivorous tumor. RUYSCH. PALLETTA. Struma fungosa (testis). CALLISEN. Spongoid inflammation. BURNS. Milt-like tumor. MUNRO. Medullary sarcoma. ABERNETHY. Cerebriform disease or cancer. LAENNEC. Pulpy testicle. BAILLIE. Carcinus spongiosus. GOOD. Carcinoma spongiosum. YOUNG. Fungoid disease. A. COOPER, HODGKIN. Medullary fungus. MAUNOIR, CHELIUS. Acute fungous tumor. C. BELL. Medullary cancer. TRAVERS. Cephaloma. HOOPER, CARSWELL. Carcinoma medullare. MUELLER. Soft cancer. AUCT. VAR.
				Scirrhus	Pancreatic sarcoma? ABERNETHY Napiform, Chondroid, } RECAMIER. Lardaceous tissue. AUCT. GALL. Carcinoma reticulare. MUELLER.	Carcinomatous sarcoma. ABERNETHY. Carcinoma scirrhosum. YOUNG. Scirrhous cancer. TRAVERS. Scirrhoma. CARSWELL. Carcinoma simplex vel fibrosum. MUELLER. Stone cancer. AUCT. VAR.

APPENDIX A

Table 2

Pembrey and Ritchie's Classification, 1913

)URS ORIGINATING IN POST-NATAL LIFE FROM NORMAL TISSUES OF INDIVIDUAL

	Innocent Tumours	Intermediate Types	Malignant Tumours
LAST:			
epithelium	Papilloma	Simple cystic epithelioma Rodent ulcer Basal-celled carcinoma	Epithelioma.
alized epi- tic structures ., breast):			
epithelium	Adenoma	Adenoma	Carcinoma.
ented epi- al structures	—	—	Melanotic carcinoma.
tissue	Glioma	—	Gliosarcoma.
inal epithe- .	Ovarian cyst	Proliferating papilloma of ovary	Carcinoma of ovary.
)BLAST:			
ective tissue	Fibroma	Keloid Recurrent fibroma	Sarcoma: Spindle-celled. Round-celled. Small round-celled. Large round-celled. Mixed-celled.
	Myeloid sarcoma	—	Myeloid sarcoma.
itive connec- tissue	Myxoma	—	Myxosarcoma.
	Lipoma	—	—
alized meso- ic structures:			
ented cells	Certain pigmented tumours in animals	—	Melanotic sarcoma.
	Osteoma: eburnated (adamantinoma), cancellous; odontoma	—	Osteosarcoma.
lage	Chondroma		Chondrosarcoma.
le	Leiomyoma (fibromyoma)	—	—
ph spaces	—	Endothelioma	Endothelioma.
phatic tissue	Lymphoma	? Certain cutaneous sarcomata	Lymphosarcoma.
blood-form- rgans	Myeloma	—	Chioroma. Leukæmia.
BLAST:			
inal mucosa	Hypoblastic papilloma	—	Malignant adenoma, carcinoma.
al hypoblas- rgans (liver, reas, thyroid,	Adenoma	—	Carcinoma.

APPENDIX A

Table 2 (concluded)
Pembrey and Ritchie's Classification, 1913

B. TUMOURS ARISING FROM ERRORS OF DEVELOPMENT

Group 1.—Tumours arising from junction of two embryos or from a process analogous to formation of monochorial twins—in either case from cells usually having the capacity of forming more than one embryonic layer.

From Somatoblast: Includes many varieties from (*a*) union of two more or less perfect individuals—*e. g.*, Siamese twins—to (*b*) one complete individual plus elements of another (teratoid dermoid cysts, teratoma).

From Trophoblast: Chorionepithelioma arising in an otherwise perfect male or female.

From Combined Somatoblast and Trophoblast: Usual form—dermoid cyst plus chorionepithelioma.

Group 2.—Tumours arising in later embryonic life from displacement of cells which usually are already so far differentiated as to be capable of forming only one type of adult tissue.

	Innocent Tumours	Intermediate Types	Malignant Tumours
From epiblast	Inclusion dermoid cysts	—	Malignant developments in dermoid cysts, branchial clefts or other epithelial embryonic remains.
Special organs	? Suprarenal rests	—	? Suprarenal rests.
	Neurocytoma	—	—
	Neurofibrilloma	—	—
From mesoblast:			
Bone	Osteoma	—	—
Cartilage	Chondroma (parotid, testicle)	—	—
Muscle	Rhabdomyoma (heart, kidney)	—	—
Bloodvessels	Angeioma	—	Angeiosarcoma.
Lymphatic vessels	Lymphangeioma	—	Lymphangeiosarcoma.
Mixed mesoblastic elements	—	Certain kidney tumours	—
From combined epiblast and mesoblast	Nævi (moles)	Mixed tumours of parotid	Epithelioma, Melanotic sarcoma, Melanotic carcinoma } developing from nævi.

C. PARASITIC TUMOURS ARISING FROM TISSUE OF EMBRYO BEING GRAFTED ON MATERNAL ORGANISM

Innocent Tumour	Intermediate Type	Malignant Tumour
Placental mole	Chorionepithelioma	Chorionepithelioma

APPENDIX A

Table 3

Hatch's Classification, 1904

THE TUMORS AS DISTRIBUTED AMONG THE FIVE PATHOLOGICAL BLASTODERMIC REGIONS OF THE BODY

Arising mostly from tissues that are under control of the "will."	I. EPIBLAST.—Epithelial hypertrophies, (corns, horns onychoma) dermoids, papilloma adenoma, papillary adenoma, hygroma, odontoma, lupus, squamous epithelioma; with exception of Cancer of Breast, all benign and non-metastatic.	Benign or non-metastatic.
	II. PARIETALOR BODILY MESOBLAST.—All (benign) tumors of connective tissue substances, viz.: fibroma, lipoma, myxoma, osteoma, chondroma, osteoid chondroma, neuroma, and the non-metastatic sarcomata (myeloid and both forms of spindle-celled sarcoma and glioma). (See foot-note.)	Benign or non-metastatic.
Arising from tissues that are not under control of the "will."	III. GENITO - URINARY MESOBLAST.—Leiomyoma, rhabdomyoma, myofibroma, cysticadenoma, ovarian cysts, sarcomata of various kinds and tubercle, but all non-metastatics in this region.	Benign or non-metastatic (even tubercle is so in this region, viz.: usually local).
	IV. VISCERAL MESOBLAST. — Angioma, lymph-angiomaandlymphoma(suspicious); generalized sarcomata (melanotic) alveolar, lymph-adenoid, and round-celled, and tubercle; all malignant and metastatic, except the two congenital new-formations, viz.: angioma and lymph-angioma.	(Home of Tubercle) Malignant generalized and metastatic tumors.
	V. HYPOBLAST. — Adenoma and cysts (suspicious) cancers, viz.: cylindrical epithelioma, soft and hard cancers, very malignant and metastatic unless they become colloid; (no papilloma in this region).	Malignant and metastatic.

From the above it may be also fairly suggested that the visceral mesoblast originated from the hypoblast.

(Foot-note). The round cells sarcomata apparently found in this region do not strictly belong to this region, but to portions of the visceral mesoblast, which are surrounded or covered by the parietal mesoblast, as in lymph-glands and vascular system.

APPENDIX A

Table 4
Charles Powell White's Classification, 1913

CLASSIFICATION OF TUMOURS

A. ORGANOMATA, or Organ Tumours.

1. Teratoma.

B. HISTIOMATA, or Tissue Tumours.

a. DESMOMATA, or Supporting Tissue Tumours.

1. Myxoma.	Mucous tissue.
2. Fibroma.	Fibrous tissue.
3. Lipoma.	Fat.
4. Chondroma.	Cartilage.
5. Chordoma.	Notochordal tissue.
6. Osteoma.	Bone.
7. Odontoma.	Dentine.
8. Glioma.	Neuroglia.

b. NEUROMATA, or Nerve Tumours.

1. Neuroma.	Nervous tissue.

c. MYOMATA, or Muscle Tumours.

1. Rhabdomyoma.	Striated muscle.
2. Leiomyoma.	Smooth muscle.

d. LYMPHOMATA, or Lymphoid Tissue Tumours.

1. Lymphoma.	Lymphoid tissue.
2. Myeloma.	Bone marrow.

e. EPITHELIAL and ENDOTHELIAL HISTIOMATA.
Papilloma, Adenoma, Angeioma.

C. CYTOMATA, or Cell Tumours.

a. BLASTOCYTOMATA.	Indifferent cells.
b. SARCOMATA (DESMOCYTOMATA).	Supporting tissue cells.
c. NEUROCYTOMATA.	Nerve cells.
d. MYOCYTOMATA.	Muscle cells.
e. LYMPHOCYTOMATA.	Lymphoid cells.
f. CARCINOMATA.	Epithelial and endothelial cells.

APPENDIX A

Table 5
Gould and Pyle's Classification, 1914
TUMORS, TABLE OF

NAME	HISTOLOGIC CONSTITUENTS	PHYSICAL MANIFESTATIONS	SEATS OF PREDILECTION
na			
ous	Acini lined with spheroidal epithelium, with varying amount of connective tissue, as in a normal gland.	Firm, rather hard consistence; inelastic; lobulated; light-gray or slightly yellow color; movable; encapsulated; generally single; rounded; when on mucous surfaces, flat and irregular.	Mamma, lip, ovary, testis, prostate, thyroid, parotid, lacrimal gland, sudoriferous and sebaceous glands.
lar	Tubules lined with cylindrical epithelium.	Soft; frequently pedunculated; grayish-white or reddish color; translucent.	Rectum and other portions of intestines; uterus.
a			
ngiectatic	Dilated blood-vessels.	Surface often covered with small, granular elevations, resembling a strawberry; often well circumscribed.	Skin, mucous membrane, brain, bones and mamma.
rnous	Spaces lined with endothelial cells and filled with blood, like corpora cavernosa of penis.	Soft, doughy; non-pulsating; leaden or blue color.	Liver, kidney, spleen, uterus, bones, muscle.
oma			
hous (hard, idal-celled)		Hard, irregular, tuberous; adherent to surrounding tissues; ulcerated. Non-encapsulated. *Ulcer.*—Irregular in outline and depth; margins hard, nodular, everted.	Mamma; alimentary tract (especially the pyloric end of stomach); glands of the skin (rare); rectum; uterus.
phaloid (soft, idal-celled)	Large epithelial cells containing one or more nuclei, without visible intercellular matrix, grouped into acini (*cancer-nests*). Vessels have walls of normal thickness and constitution, and ramify in the stroma, and not among the cells themselves.	Soft, globular, or bossellated; elastic, compressible; fluctuating; non-encapsulated.	Testicle; ovary; mucous membranes.
id (probably eration of the preced- rieties)	Three varieties are described histologically: (*a*) squamous, made up of squamous or flat epithelium; (*b*) cylindrical, containing columnar cells; (*c*) glandular, composed largely of polyhedral cells, like those of secreting glands.	Soft; jelly-like; contains mucoid material; semitranslucent; glistening; at places diffluent.	Stomach; intestine; ovary; mamma; thyroid.
ma	A form of round-celled sarcoma (*which see*).	Small nodules.	Periosteum of skull.
teatoma	Concentric layers formed of flat cells of an epithelial character, arranged in whorls enclosing cholesterin plates. Belongs probably to the *Teratomata* from the occurrence in it of sebaceous glands, hair-follicles, etc.	Solitary or multiple nodules or nodes.	Brain and meninges.
roma (*ndroma*)	Hyaline or fibro-cartilage, with few blood-vessels. The cells are arranged irregularly and have irregular shapes, many being stellate or spindle-shaped.	Hard; elastic; nodular or lobulated, sometimes smooth; round; encapsulated; usually single, but may be multiple and symmetric.	The bones, especially on or in, the phalanges; scapula, ilium, upper jaw; subcutaneous tissue; salivary glands (parotid); testicle; bronchial cartilages.
elioma	Multiplication of endothelial cells lining lymph-passages. A variety of sarcoma. Large, round cells containing one or two nuclei. Resembles epithelial new-growths.	Circumscribed or extensive flat growths, spreading over the serous membranes; white in color.	Pleura and peritoneum; membranes of brain.

Table 5 (continued)
Gould and Pyle's Classification, 1914
TUMORS, TABLE OF

Name	Histologic Constituents	Physical Manifestations	Seats of Predilection
Epithelioma 1. *Squamous*	Composed of pegs or columns of cuboidal epithelial cells which first infiltrate the subjacent connective tissue, then every underlying structure, including bone, in their track. These ingrowths contain the *cell-nests, epidermal pearls, or pearly bodies.*	Dense; inelastic; non-encapsulated; ulcerated; edges of ulcer indurated.	Nose, lower lip, penis, scrotum, vulva, anus, tongue, gums, palate, tonsils, larynx, pharynx, esophagus, bladder, or uterus, hands and feet (rare).
2. *Cylindric-celled* or *columnar-celled*	Originates either from the cylindric surface-epithelium of a mucous membrane, or from that of glands lined by columnar epithelium. Contains no "cell-nests." Consists of alveoli containing cylindric cells at the periphery, and irregular cells in the center. Presents the character of adenocarcinoma.	Soft, infiltrating masses or nodes, or papillomatous growths.	Stomach; intestinal tract; uterus; gall-bladder; biliary passages; respiratory tract.
Fibroma 1. *Hard*	White, fibrous tissue, consisting of fibers and few connective tissue corpuscles; blood-vessels few.	Ovoidal or spherical; lobulated; nodular or bosselated; pedunculated or sessile; firm, elastic; encapsulated; glistening white, yellowish, or slightly red color; unattached to overlying tissues; single or multiple.	Uterus; periosteum; ovary; labium majus; mamma; testicle; tendons; aponeurosis; neurilemma of nerves; around articulations; subcutaneous tissue; rectum.
2. *Soft*	Few fibers, many cells.	Soft, compressible; sessile or pendulous; single or multiple; encapsulated.	
Glioma	Round cells, with large nuclei, embedded in a scanty, granular, intercellular substance. After the type of the neuroglia of the brain.	Soft, gelatinous, glue-like tumor; not distinctly outlined; somewhat translucent. Usually single.	Brain; retina; spinal cord; optic and auditory nerves; suprarenal capsules.
Lipoma	Adipose tissue (fat-vesicles larger than normal) bound together by delicate connective tissue.	Circumscribed; lobulated, soft, doughy, pseudo-fluctuating, inelastic; attached to the skin—hence dimpled; ovoidal, spherical, or flattened; occasionally pedunculated; usually surrounded by a thin capsule; usually single; when multiple, usually hereditary.	Back of neck; shoulders; back; nates; inside of arm and thigh; submucous and subserous connective tissue.
Lymphangioma	Aggregation of dilated lymphatic vessels and lymph-spaces supported by connective tissue.	Soft, doughy, transparent sacs or vesicles, filled with lymph; often feels like a series of tangled cords.	Posterior and inner surfaces of thigh, genitals; anterior abdominal wall; neck, nates, axilla, groin, penis, tongue, cheeks, lips, liver, kidney.
Lympho-sarcoma	Hyperplasia of the lymphoid cells of the lymphatic glands.	Glands for a time preserve their shape, but soon extends to neighboring tissues.	Neck, groin, axilla, mediastinum, etc.
Myoma 1. *Leiomyoma*	Smooth, non-striated, muscular fibers, such as occur in the uterus, with varying quantities of fibrous tissue; few blood-vessels. The fibers are composed of spindle-shaped cells containing large, rod-shaped nuclei.	Rounded or pyriform, well-circumscribed; hard; firm; smooth or nodular; white or flesh-colored; encapsulated or non-encapsulated; often multiple.	Uterus, esophagus, intestine, prostate, stomach.
2. *Rhabdomyoma*	Striated muscular fibers, often undeveloped, being spindle-shaped, and associated with sarcomatous tissue.	Large roundish masses or small nodules.	Kidney, ovary, testicle; tongue, heart.

APPENDIX A

Table 5 (concluded)
Gould and Pyle's Classification, 1914
TUMORS, TABLE OF

NAME	HISTOLOGIC CONSTITUENTS	PHYSICAL MANIFESTATIONS	SEATS OF PREDILECTION
Myxoma	Delicate network of stellate cells enclosing a mucoid intercellular substance. *Type.*—Wharton's jelly; vitreous humor.	Round or lobular; soft, gelatinous; semitranslucent; encapsulated; elastic; may be fluctuating.	Nasal cavities; mammæ; intermuscular spaces; submucous and subserous tissues; back; thighs; lip; cheek; labia; clitoris; prepuce; scrotum; axilla; parotid; ear; more rarely periosteum, bone, heart, and nerve-sheaths.
Neuroma	Medullated or non-medullated nerve-fibers. Very rarely may contain ganglionic cells; usually combined with fibrous tissues.	Spheric, ovoid, oblong, or bulbous; sometimes plexiform; firm; painful on pressure; few or many (even hundreds).	Cut ends of nerves, as in stumps of amputation, on skin.
Osteoma	Osseous tissue (cancellous or compact bone).	Hard; often lobulated; sometimes spheric; may be spinous or spiculated; pedunculated or sessile; usually single; may be multiple and symmetric.	Cranial bones, maxilla, orbit; ends of phalanges; juxtaepiphyseal portions of long bones (tibia, femur, humerus, etc.); dura mater; muscle; aponeurosis; lungs.
Papilloma	Hypertrophied papillæ of the skin; varying amount of connective tissue surrounding two or more central blood-vessels, and covered by several layers of ephithelial cells.	Circumscribed; hard (on the skin); soft (on mucous membrane); surface smooth, brush-like, or cauliflower-like; single or multiple.	Skin of hands and genitalia; larynx; bladder; rectum; nose.
Psammoma	A form of sarcoma (*nest-celled*). Connective tissue composed of flat, elongated cells of great size and in which are embedded gritty concretions that are composed of calcium carbonate.	Hard, circumscribed; light color.	Membranes of brain, choroid plexus; pineal gland; spinal cord; nerves.
Sarcoma			
1. ***Round-celled***	Embryonic or immature connective tissue. Blood-vessels without walls, or thin-walled, ramifying among the cells. Small or large round cells, embedded in a small amount of granular or homogeneous intercellular substance.	Soft; vascular; whitish; somewhat translucent; on pressure after some hours exudes a milky fluid; round or ovoid, or oblong.	Periosteum; bone; lymphatic glands; subcutaneous tissue; testicle; eye; ovary; lungs; kidneys; intermuscular septa.
2. ***Spindle-celled***	Cells varying much in size, spindle-shaped, with long, fine tapering extremities, separated by very little intercellular substance. Often have a fibrous appearance (Recurrent Fibroid).	Firm; reddish; does not exude milky fluid. Shape as foregoing.	Subcutaneous tissue; fasciæ and intermuscular septa; periosteum; interior of bones; eye; antrum; breast; testicle.
3. ***Giant-celled*** (***Myeloid***)	Masses of protoplasm containing two or more nuclei—up to 20 or 50— with a varying amount of round and spindle cells.	Jelly-like consistence or firm, like muscle. Shape as foregoing.	Lower and upper jaw; lower end of femur; head of tibia.
4. ***Alveolar***	Alveolar space filled with sarcoma cells; the trabeculæ composed of spindle-cells.	Very vascular; soft.	Skin; eye; bone; lymphatic glands, pia mater of brain. Often springs from warts.
5. ***Melanotic***	Sarcomata of various kinds in which brownish or black pigment becomes deposited as amorphous granules in the cells as well as the connective tissue and blood-vessel walls of the tumor.	Rounded, nodular, dark colored tumors of varying size and consistency, usually hard.	Where pigment occurs normally; the eye and the skin, the pia; secondarily, especially in the liver.
Dermoid Cyst	Cyst wall contains hair-follicles and sebaceous glands. *Contents.* — Disintegrating epithelial cells, hair, sebaceous matter, teeth, etc.	Globular; tense; smooth; freely movable.	Outer angle of orbit; over root of nose; ovary; testicle.

APPENDIX A

Table 6
Bertillon International Classification of Tumors

Cancers and Other Malignant Tumors

NOTE.—The term "Cancer," for statistical purposes, is a general one that includes all forms of malignant neoplasms.

Forms of Cancer

Adenocarcinoma
Alveolar cancer
sarcoma
Angiosarcoma
Cancer
Cancerous new growth
tumor
ulcer
Carcinoma
myxomatodes
Cancroid
Cephaloma
Chondrosarcoma
Colloid carcinoma
tumor
Columnar-celled carcinoma
Cystosarcoma
Encephaloid cancer
carcinoma
tumor
Endothelioma
Epithelioma
Fibrocarcinoma
Fibrosarcoma
Fungus hæmatodes
Giant-celled sarcoma
Glandular cancer
Hæmendothelioma
Heteromorphic tumor
Hypernephroma
Lymphendothelioma
Lymphosarcoma
Malignant degeneration
Malignant disease
endothelioma
fungous tumor
growth
neoplasm
new growth
perithelioma
tumor
ulcer
ulceration
Medullary cancer
fungus
Melanoid tumor
Melanosarcoma
Melanotic cancer
Metastatic cancer
Myeloid sarcoma
Myxosarcoma
Neoplastic tumor (malignant)
Ossifying sarcoma
Osteosarcoma
Papilliferous carcinoma
Plexiform sarcoma
Rose cancer
Round-celled cancer
Sarcoma
Scirrhous carcinoma
Scirrhus
Spheroidal-celled carcinoma
Spindle-celled carcinoma
Squamous-celled carcinoma
Superficial cancer
Transitional-celled carcinoma

The location of the cancer, or preferably, as recommended by the Committee of the American Medical Association, the seat of origin of the cancer, if known, should always be stated so that the return may be classified properly under one of the titles 39 to 45. Non-malignant tumors or "tumors" of uncertain character are classified under the organ or part of the body affected or under title 46.

39. Cancer and Other Malignant Tumors of the Buccal Cavity

This title includes

Cancer and other malignant tumors of
Buccal cavity
Cheek
Gum
Jaw
Lip
Maxilla
Mouth
Palate
Cancer, etc.—continued.
Salivary gland
Soft palate
Tongue
Tonsil
Carcinoma linguæ
Lingual cancer
Smokers' cancer

Table 6 (continued)
Bertillon International Classification of Tumors

40. Cancer and Other Malignant Tumors of the Stomach, Liver

This title includes

Cancer and other malignant tumors of
- Bile duct
- Cardia
- Cardiac orifice of stomach
- Gall bladder
  - duct
- Liver
- Œsophagus
- Pharynx

Cancer, etc.—continued.
- Pylorus
- Stomach

Carcinoma ventriculi
Gastric tumor
Gastrocarcinoma
Hepatic cancer
Melanosis of liver
Tumor of stomach

This title does not include Hæmatemesis (108).

41. Cancer and Other Malignant Tumors of the Peritonaeum, Intestines, Rectum

This title includes

Cancer and other malignant tumors of
- Abdominal viscera
- Anus
- Appendix
- Cæcum
- Caput coli
- Colon
- Duodenum
- Ileum
- Intestinal gland
- Intestine
- Mesentery
- Omentum

Cancer, etc.—continued.
- Peritonæum
- Rectum
- Retroperitoneal gland
- Sigmoid flexure

Cancerous peritonitis
Carcinoma entericum
Lymphosarcoma of peritonæum
Malignant internal stricture
- peritonitis
- stricture of intestine
- ulceration of intestine

Retroperitoneal cancer

42. Cancer and Other Malignant Tumors of the Female Genital Organs

This title includes

Cancer and other malignant tumors of
- Broad ligament
- Cervix
- Falloppian tube
- Female genital organ
- Ovary
- Uterine ligament
- Uterus
- Vagina
- Vulva

Cancer, etc.—continued.
- Womb

Cervical cancer
Chorioepithelioma
Deciduoma malignum
Hydatid mole
Hydatidiform mole
Neoplasm of uterus
Syncytioma

43. Cancer and Other Malignant Tumors of the Breast

This title includes

Cancer and other malignant tumors of
- Breast
- Mammary gland
- Nipple

Cancer, etc.—continued.
Cancer en cuirasse
Neoplasm of breast

Table 6 (continued)
Bertillon International Classification of Tumors

44. Cancer and Other Malignant Tumors of the Skin

This title includes

Cancer and other malignant tumors of
- Auricle (of ear)
- Chin
- Connective tissue
- Ear
- Face
- Head
- Nose
- Scalp
- Skin

Cancer, etc.—continued.
- Umbilicus

Cancroid (unqualified)
Cervicofacial cancer
Columnar epithelioma
Epithelial tumor (location not indicate
Epithelioma (location not indicated)
Noli me tangere
Rodent dermatitis
  ulcer

This title does not include Esthiomene (34).—Lupus (34).

45. Cancer and Other Malignant Tumors of Other Organs or of Or not Specified

NOTE.—This is a residual title that includes all deaths from cancer that can n assigned to the preceding titles, 39-44, and especially those in which the location or o of the disease is not stated. Inquiry should be made in such cases and fuller inform obtained if possible.

This title includes

Cancer and other malignant tumors, *with location not stated*, or of
- Abdomen
- Accessory sinus
- Adrenal
- Anterior mediastinum
- Antrum
- Arm
- Artery
- Axilla
- Back
- Bladder
- Body
- Bone
- Brain
- Bronchi
- Cervical gland
- Chest
- Chorioid
- Conjunctiva
- Cord
- Cornea
- Extremity
- Eye
- Fauces
- Ganglia
- Genital organ (male)
- Gland
- Glandular system
- Groin
- Hand
- Heart
- Hip
- Iliac region

Cancer, etc.—continued.
- Inguinal gland
  - region
- Iris
- Joint
- Kidney
- Lacrimal apparatus
- Larynx
- Leg
- Lower extremity
- Lung
- Lymph gland
  - node
- Lymphatic gland
  - vessel
- Mediastinal gland
- Mediastinum
- Membrane of brain
  - spinal cord
- Meninges
- Muscle
- Nates
- Neck
- Nerve
- Orbit
- Pancreas
- Parotid gland
- Pectoral region
- Pelvic viscera
- Pelvis
- Penis
- Pericardium
- Perinæum

Table 6 (continued)
Bertillon International Classification of Tumors

and Other Malignant Tumors of Other Organs or of Organs not Specified (concluded)

—continued.	Cancerous cachexia
	goitre
r nares	humor
	neuritis
	toxæmia
	Carcinomatous septichæmia
	Chimney-sweeps' cancer
	Disseminated cancer
	General carcinomatosis
ord	sarcomatosis
	Intraabdominal cancer
	Lobstein's cancer
	Malignant disease (undefined)
al	fistula
l region	prostatitis
	Miliary carcinosis
	Multiple cancer
	melanosarcomata
gland	Pelvic cancer
d	Pulmonary cancer
	Renal cancer
xtremity	Retropharyngeal cancer
	Rhabdomyosarcoma of kidney
	Sarcocele
	Sarcomatosis (unqualified)
	Sarcomatous phlebitis
	Thyreosarcoma

es not include Cancer of œsophagus (40).—Cancer of the anus (41).—Cancer of the ovary, of he vulva (42).

r Tumors (Tumors of the Female Genital Organs Excepted)

The term "Tumor," for statistical purposes, is a general one that includes nonmalignant neoplasms.

Forms of Tumor

a	Erectile tumor
	Fatty tumor
na	Fibroid
	tumor
oma	Fibrolipoma
r	Fibroma
	molluscum
s tumor	Fibroplastic tumor
mphangioma	Fibrous tumor
evus	Fungous tumor
	Ganglionic neuroma
	Glandular cyst
a	tumor
ma	Glioma
angioma	Hæmangioma
	Hæmatoma (nontraumatic)
	Leiomyoma
t	Lipoma
a	Lymphangioma

Table 6 (concluded)
Bertillon International Classification of Tumors

46. Other Tumors (Tumors of the Female Genital Organs Excepted) (concluded)

Forms of Tumor

Lymphatic nævus
Lymphatocele
Lymphoma
Mucous cyst
Myoma
Myxochondroma
Myxofibroma
Myxoma
Nævolipoma
Neoplasm (nonmalignant or unqualified)
Neoplastic growth (nonmalignant or unqualified)
tumor (nonmalignant or unqualified)
Neurofibroma
Neurofibromatosis
New growth (nonmalignant or unqualified)
Papilloma
Polypus
Retention cyst
Rhabdomyoma
Sebaceous cyst
tumor
Sequestration dermoid cyst
Serous cyst
Striped muscle tumor
Suppurative cystic tumor
Teratoma
Tumor (nonmalignant or unqualified)
Vascular tumor

The location of the tumor should always be stated. The word "tumor" is frequently used indefinitely and may mean a malignant tumor or cancer (titles 39 to 45); inquiry should always be made on this point and a definite statement of malignancy or nonmalignancy obtained if possible. Title 46 is misleading in its wording because not only are tumors of the female genital organs (uterus, ovary) excepted, but also all other tumors that can be referred to a definite organ or part of the body. The title is a residual one and contains only those tumors for which the location is ill defined or not stated.

This title includes

Billroth's disease
Myomectomy
Pelvic tumor
Rupture of cyst
Tumor (see forms of tumor above), *with location not stated*, or of—
Abdomen
Axilla
Blood vessel
Chest
Tumor, etc.—continued.
Connective tissue
Gland
Hip
Mediastinal gland
Mediastinum
Muscle
Neck
Thorax

This title does not include Cancer and its synonyms (39-45).—Tumor of the stomach (40).—Stercoral tumor (109).—Tumor of the uterus (129).—Hydatid tumor (112).—Cyst of the ovary (131).—Aneurysmal tumor (81).—Varicose tumor (83).—Polypus of the ear (76).—Polypus of the nasal fossæ, or nasopharynx (86).—Uterine polypus (129)—[and many other "tumors." See CANCER and TUMOR in Index.]
Frequent complication: Purpura.

APPENDIX A

Table 7

Bertillon International Classification of Diseases Allied to Tumors

112. Hydatid Tumor of the Liver

This title includes

Cysticercus cellulosæ
of liver
Echinococcus
cyst of liver
of liver
Hydatid (unqualified)
cyst

Hydatid cyst of liver
disease
of liver
tumor
of liver

114. Biliary Calculi

This title includes

Biliary calculus
colic
lithiasis
Calculus of gall bladder
liver
Cholæmic gall stones
Cholelithiasis
Colic from gall stones

Gall stones
in intestine
Hepatic calculus
colic
Impacted calculus of liver
gall stones
Impaction of gall bladder

102. Ulcer of the Stomach

This title includes

Erosion of stomach
Gastric erosion
ulcer
ulceration
Gastroduodenal ulcer
Gastroœsophageal ulcer
Peptic ulcer
Perforating gastric ulcer

Perforating ulcer of stomach
Round ulcer
of stomach
Ulcer of peptic gland
pylorus
stomach
Ulcus rotundum
ventriculi

Frequent complications: Hæmatemesis.—Perforation of the stomach.—Peritonitis.—Subphrenic abscess.

123. Calculi of the Urinary Passages

This title includes

Calculous disease
pyelitis
pyelonephritis
pyonephrosis
Calculus
of bladder
kidney
pelvis of kidney
ureter
urethra
urinary duct
passage
tract
Cystic calculus
Gravel (urinary)
Impacted calculus of kidney
ureter
urethra
renal calculus

Lithiasis
Lithoclasty
Lithotomy
Lithotrity
Nephritic calculus
colic
Nephrolithiasis
Nephrolithotomy
Pyonephrosis from calculus
Renal calculus
colic
Stone
in bladder
kidney
Ureteral colic
Ureterolithotomy
Urinary calculus
lithiasis
Vesical calculus

This title does not include Prostatic calculi (126).

Table 7 (concluded)

Bertillon International Classification of Diseases Allied to Tumors

129. Uterine Tumor (Noncancerous)

This title includes

Bleeding fibroid (female)
Cystic degeneration of uterus
Deciduoma
Fibrocyst of uterus
Fibroid body of uterus
  of cervix of uterus
  uterus
  tumor of female genital organ
  uterus
Fibroma (female)
  of uterus
Fibromyoma
  of uterus
Fungous growth of uterus
Huguier's disease
Hysteromyoma
Hysteromyomectomy
Multiple fibroid
Myoma of uterus
New growth of uterus (nonmalignant)
Polypus of uterus
Recurrent cyst of uterus
Submucous fibroid (female)
Tumor of uterus

131. Cysts and Other Tumors of the Ovary

This title includes

Castration (female)
Cyst of ovary
Cystic ovary
Cystoma of ovary
Dermoid cyst of ovary
Dropsy of ovary
Encysted dropsy
Fibroid of ovary
Hæmatoma of ovary
Multilocular cyst
New growth of ovary (nonmalignant)
Oophorectomy
Ovarian cyst
  dropsy
  tumor
Ovariotomy
Papilloma of ovary
Paracentesis of cyst of ovary
  parovarian cyst
Parasitic disease of ovary
Parovarian cyst
Tumor of ovary

Tables 6 and 7 are derived from the Manual of the International List of Causes of Death, 2d ed. Government Printing Office, Washington, 1913. See also in this connection Index of Joint Causes of Death, Government Printing Office, Washington, 1914. Both of these publications are issued by the Bureau of the Census, Division of Vital Statistics.

APPENDIX A

Table 8

Imperial Cancer Research Fund Classification, 1903

NOTE explaining the three groups "accessible," "inaccessible," and "intermediate." The terms refer to the site of the primary growth. The grouping is adopted for the purposes of this report and may require to be modified when we have to interpret the data for a greater number of years.*

Accessible. Skin, Sub-cutaneous Tissue, Lips, Tongue, Floor of Mouth, Buccal Mucous Membrane, Antrum, Maxilla, Mandible, Palate, Tonsil, Eye, Eyelid, Orbit, Cervical glands, Breast, Sternum and Ribs, Scapula, Clavicle, Humerus, Bones of Arm, Annularis, Bones of Lower Limbs, Muscles of Trunk, Muscles of Upper Limbs, Muscles of Lower Limbs, Penis, Scrotum, Testis, Clitoris, Vulva, Vagina, Anus.

Inaccessible. Brain and Spinal Cord, Pharynx, Œsophagus, Lung, Pleuræ and Mediastinum, Tracheal glands, Mediastinal glands, Heart, Pericardium, Stomach, Small Intestine, Cæcum, Appendix, Colon, Hepatic Flexure, Splenic Flexure, Sigmoid, Liver and Gall-Bladder, Pancreas, Adrenal, Kidney, Ureter, Bladder, Prostate, Retro-peritoneal glands, Peritoneum, Ovary, Spinal Column, Sacrum, Pelvic Bones.

Intermediate. Skull, Larynx and Epiglottis, Trachea, Parotid, Urethra, Rectum, Uterus, Thyroid, Glands not specified, Nerves, Site not specified.

King and Newsholme in their report on "The Alleged Increase of Cancer," read before the Royal Society in 1893, divided cancers into only two groups, *accessible* and *inaccessible*. They explain their classification as follows: "Under 'Accessible cancer' we have included only the four headings, Tongue, Mamma, Uterus and Vagina, all of which are capable of careful and exact diagnosis. Under 'Inaccessible cancer' come cancers primarily affecting any other part of the body. . . . The classification cannot be regarded as perfect. Thus it may be pointed out that the first group embraces a large excess of women, among whom it is shown by the Registrar-General's returns in Great Britain that the apparent increase in cancer has been in less ratio than among men. In the next place, it may be argued that we have placed under the 'inaccessible' division cancer of certain parts that might be more appropriately described as accessible."

*Scientific Reports on the Investigations of the Imperial Cancer Research Fund, by Dr. E. F. Bashford. Report No. 2, Part I.—The Statistical Investigation of Cancer, London, 1905.

APPENDIX

B

Cancer Records, Inquiry Blanks and Forms

Table		Page
1	United States Standard Death Certificate	285
2	Cancer Inquiry Blank of the Imperial Cancer Research Fund	287
2a	Statistics showing the frequency with which microscopical examination in cases of Carcinoma and Sarcoma is made in Operation and Post-Mortem material and the proportion of cases in each group in which Cancer was diagnosed	288
3	Cancer Blank of the New York State Department of Health	290
4	Question Form for International Cancer Statistics	292
5	Question Form of the George Crocker Special Research Fund	294
6	Uterine Cancer Blank of the American Society for the Control of Cancer	296
7	Buccal Cavity Cancer Blank of the American Society for the Control of Cancer	298
8	Mammary Cancer Blank of the American Society for the Control of Cancer	300
9	Gastric Cancer Blank of the American Society for the Control of Cancer	302
10	Supplementary Letter of Inquiry on Statistics of Cancer of the Division of Vital Statistics of the United States Census	304

APPENDIX B

Table 1

United States Standard Death Certificate

WRITE PLAINLY, WITH UNFADING INK—THIS IS A PERMANENT RECORD

B.—Every item of information should be carefully supplied. AGE should be stated EXACTLY. :IANS should state CAUSE OF DEATH in plain terms, so that it may be properly classified. Exact nt of OCCUPATION is very important. See instructions on back of certificate.

1 **Place of Death**

DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS

STANDARD CERTIFICATE OF DEATH

....

ip.......................

State of............................

Registered No..............

....

.....................(No........., ...St.; ....Ward) [If death occurred in a hospital or institution, give its NAME instead of street and number.]

'ull Name ....

NAL AND STATISTICAL PARTICULARS	MEDICAL CERTIFICATE OF DEATH
4 COLOR OR RACE — 5 Single, Married, Widowed, or Divorced (*Write* the word)	16 DATE OF DEATH ...., 191.. (*Month*) (*Day*) (*Year*)
OF BIRTH ...., 1..... (*Month*) (*Day*) (*Year*)	17 I HEREBY CERTIFY, That I attended deceased from........, 191.., to................., 191.., that I last saw h.... alive on.............., 191..,
...yrs.......mos.......ds. — If LESS than 1 day,.....hrs. or......min.?	and that death occurred, on the date stated above, at......m. The CAUSE OF DEATH* was as follows:...
'ATION 'ade, profession, or ular kind of work........................ eneral nature of Industry, :ss, or establishment in employed (or employer)................	....(Duration) .....yrs. .....mos. .....ds.
PLACE : or country)	Contributory (*Secondary*) ....(Duration) .....yrs. .....mos. .....ds.
NAME OF ATHER	(Signed)...............................M. D. ....,191.. (Address)....................
BIRTHPLACE F FATHER State or country)	*State the DISEASE CAUSING DEATH, or, in deaths from VIOLENT CAUSES, state (1) MEANS OF INJURY; and (2) whether ACCIDENTAL, SUICIDAL, or HOMICIDAL.
MAIDEN NAME F MOTHER	18 LENGTH OF RESIDENCE (For Hospitals, Institutions, Transients, or Recent Residents) At place of death..yrs...mos...ds. In the State..yrs...mos...ds.
BIRTHPLACE F MOTHER State or country)	Where was disease contracted, if not at place of death?.......................... Former or usual residence................................
ABOVE IS TRUE TO THE BEST OF MY KNOWLEDGE mant)................................. Address)...............................	19 PLACE OF BURIAL OR REMOVAL — DATE OF BURIAL ...., 191..
..........., 191....................... *Registrar*	20 UNDERTAKER — ADDRESS

Table 1 (concluded)
United States Standard Death Certificate
(reverse)

Revised United States Standard Certificate of Death

[Approved by U. S. Census and American Public Health Association]

Statement of occupation.—Precise statement of occupation is very important, so that the relative healthfulness of various pursuits can be known. The question applies to each and every person, irrespective of age. For many occupations a single word or term on the first line will be sufficient, e. g., *Farmer* or *Planter, Physician, Compositor, Architect, Locomotive engineer, Civil engineer, Stationary fireman,* etc. But in many cases, especially in industrial employments, it is necessary to know (*a*) the kind of work and also (*b*) the nature of the business or industry, and therefore an additional line is provided for the latter statement; it should be used only when needed. As examples: (*a*) *Spinner,* (*b*) *Cotton mill;* (*a*) *Salesman,* (*b*) *Grocery;* (*a*) *Foreman,* (*b*) *Automobile factory.* The material worked on may form part of the second statement. Never return "Laborer," "Foreman," "Manager," "Dealer," etc., without more precise specification, as *Day laborer, Farm laborer, Laborer—Coal mine,* etc. Women at home, who are engaged in the duties of the household only (not paid *Housekeepers* who receive a definite salary), may be entered as *Housewife, Housework,* or *At home,* and children, not gainfully employed, as *At school* or *At home.* Care should be taken to report specifically the occupations of persons engaged in domestic service for wages, as *Servant, Cook, Housemaid,* etc. If the occupation has been changed or given up on account of the DISEASE CAUSING DEATH, state occupation at beginning of illness. If retired from business, that fact may be indicated thus: *Farmer* (*retired, 6 yrs.*). For persons who have no occupation whatever, write *None.*

Statement of cause of death.—Name, **first**, the DISEASE CAUSING DEATH (the primary affection with respect to time and causation), using always the same accepted term for the same disease. Examples: *Cerebrospinal fever* (the only definite synonym is "Epidemic cerebrospinal meningitis"); *Diphtheria* (avoid use of "Croup"); *Typhoid fever* (never report "Typhoid pneumonia"); *Lobar pneumonia; Bronchopneumonia* ("Pneumonia," u ified, is indefinite); *Tuberculosis of meninges, peritoneum,* etc., *Carcinomc coma,* etc., of.........(name origin; cer" is less definite; avoid use of "T for malignant neoplasms); *Measles; W ing cough; Chronic valvular heart d Chronic interstitial nephritis,* etc. contributory (secondary or intercu affection need not be stated unle portant. Example: *Measles* (disease ing death), *29 ds.; Bronchopneu* (secondary), *10 ds.* Never report symptoms or terminal conditions, s "Asthenia," "Anaemia" (merely sy matic), "Atrophy," "Collapse," "C "Convulsions," "Debility" ("Conge "Senile," etc.), "Dropsy," "Exhaus "Heart failure," "Haemorrhage," " tion," "Marasmus," "Old age," "Sh "Uraemia," "Weakness," etc., wh definite disease can be ascertained a cause. Always qualify all diseases r ing from childbirth or miscarriag "PUERPERAL *septichaemia,*" "PUER *peritonitis,*" etc. State cause for surgical operation was undertaken. VIOLENT DEATHS state MEANS OF INJUR qualify as ACCIDENTAL, SUICIDAL, or CIDAL, or as *probably* such, if impossi determine definitely. Examples: *dental drowning; Struck by railway tr accident; Revolver wound of head—hom Poisoned by carbolic acid—probably su* The nature of the injury, as fractu skull, and consequences (e. g., *s tetanus*) may be stated under the he "Contributory." (Recommendation statement of cause of death approve Committee on Nomenclature of the A can Medical Association.)

NOTE.—Individual offices may add to abo of undesirable terms and refuse to accept cates containing them. Thus the form in New York City states: "Certificates will be re for additional information which give any following diseases, without explanation, as th cause of death: Abortion, cellulitis, childbirth vulsions, haemorrhage, gangrene, gastritis, erys meningitis, miscarriage, necrosis, peritonitis, bitis, pyaemia, septichaemia, tetanus." But adoption of the minimum list suggested will vast improvement, and its scope can be extende later date.

11—31

APPENDIX B

Table 2

Cancer Inquiry Blank of the Imperial Cancer Research Fund

IMPERIAL CANCER RESEARCH FUND

Year............ *Hospital Refce*........ *Age*.... *Sex*.... *Occup*....

Microscopical Examination

at operation { ....
....

at P. M. { ....
....

Clinical Diagnosis........................ *Primary Site*................

Secondaries..

Cachexia............ *Ulceration*............ *Obstruction*..........

Date of Primary Operation.......... *Dates of Recurrences*....................

Family History.................................. { B....
S....

Personal History { *Duration*.......... *Puberty*.... *Menopause*......
....

.... *Date of Death*........ *Age at Death*..

Residence.......................... *Duration of Residence*................

Cross References......................................

Remarks...

*UNIFORMITY IN HOSPITAL STATISTICS

"A preliminary inquiry was made to ascertain whether or not sufficiently extensive statistics of cancer, of the nature described above, could be compiled. The results showed that several of the metropolitan hospitals were in a position to supply positive information on all the headings under which facts were sought. It was then necessary to devise means for the systematic utilisation of these facts and to obtain the collaboration of the hospital authorities in securing a uniform method of investigating, classifying and recording cases of malignant new growths and of growths which had been erroneously regarded as malignant. This was secured by the majority of the hospital authorities, who directed certain members of their staffs to record all cases on cards, containing headings arranged as shown opposite, and to forward them to the office of the Imperial Cancer Research Fund. By this means a card index of nearly all the cases occurring in the metropolitan hospitals is provided. With the help of such cards, the information can be readily classified under any heading. The headings under which information is asked must of necessity be determined by the progress of the entire investigation. The card reproduced opposite has been in use since the inquiry was started. It was devised to elicit as much information as possible and may be modified to meet any future requirements of the research. The uniformity thus attained in some of the metropolitan hospitals has been the ideal to which the investigations in the Colonies and elsewhere has been made to approximate, and cannot fail to react upon statistical inquiries on cancer generally." *(Statistical Investigations of Cancer, Part 1, page 10, London, 1905.)

TABLE 2a.—Showing the frequency with which Microscopical Examination in cases of Carcinoma and Sarcoma is made in Operation and Post-Mortem material and the proportion of cases in each group in which Cancer was diagnosed or not diagnosed, and indicating the presence of conditions leading to the wrong diagnosis of Malignant New Growth. (Preliminary Investigation of Hospital Records.)

OPERATION CASES | POST-MORTEM CASES

Operation: Carcinoma						Operation: Sarcoma								Post-Mortem: Carcinoma						Post-Mortem: Sarcoma					
Microscopical Examination						Microscopical Examination								Microscopical Examination						Microscopical Examination					
Recorded			Not recorded			Recorded			Not recorded				PRIMARY SITE	Recorded			Not recorded			Recorded			Not recorded		
Diagnosed	Not diagnosed	Wrongly diagnosed	Diagnosed	Not diagnosed	Wrongly diagnosed	Diagnosed	Not diagnosed	Wrongly diagnosed	Diagnosed	Not diagnosed	Wrongly diagnosed			Diagnosed	Not diagnosed	Wrongly diagnosed	Diagnosed	Not diagnosed	Wrongly diagnosed	Diagnosed	Not diagnosed	Wrongly diagnosed	Diagnosed	Not diagnosed	Wrongly diagnosed
	+	−		+	−		+	−		+	−				+	−		+	−		+	−		+	−
18		−2	18	..		..	..		..	..		Skin	Rodent Ulcer	1	+1		1	..		..	..		..	..	
2	..		..	..		..	..		..	..			Scalp	..	..		..	..		..	..		..	..	
1	+1		1	..		..	..		..	..			Ear	..	..		..	..		..	..		..	..	
1	..		..	..		..	..		..	..			Forehead	..	..		..	..		..	..		..	..	
1	..		..	..		..	..		..	..			Zygoma	..	..		..	..		..	..		..	..	
12		−2	4	..		..	..		..	..			Cheek	2	..		..	..		..	..		..	..	
1	..		..	..		..	..		..	..			Nose	..	..		..	..		..	..		..	..	
..	+1		..	..		..	..		..	..			Back and Trunk	..	..		..	..		..	..		..	..	
..	..		..	..		..	..		..	..			Arm	1	..		..	..		..	..		..	..	
3	..		..	..		..	..		..	..			Hand	..	..		1	..		..	..		..	..	
1	..		..	..		..	..		..	..			Index	..	..		..	..		..	..		..	..	
..	+2		..	..		..	..		..	..			Groin	..	..		..	..		..	..		..	..	
1	+1		..	..		..	..		..	..			Leg	1	..		1	..		..	..		..	..	
1	..		..	..		..	..		..	..			Scrotum	..	..		..	..		..	..		..	..	
4	..		..	..		..	..		..	..			Vulva	1	..		1	+1		..	..		..	..	
4	..		4	..		..	..		..	..			Penis	..	..		3	..		..	..		..	..	
19	+1	−4	11	..		..	..		..	..			Lip	1	..		1	..		..	..		..	..	
39		−4	23	..		..	..		..	..			Tongue	11	+2	−2	23	..		..	..		..	..	
4		−1	7	..		..	..		..	..			Floor of Mouth	3	..		3	..		..	..		..	..	
..	..		6		−1	..	..		..	..			Larynx and Epiglottis	6	+1		4	..		..	..		..	..	
..	+1		3	..		..	..		..	..			Pharynx	7	+1		6	..		2	..		..	..	
1	+1		22	..		..	..		..	..			Œsophagus	37	+11		43	+8		..	..		1	..	
10		−1	35	+4		..	..		..	..			Stomach	66	+21		68	+18		2	+1		..	..	
..	+1		3	..		..	..		..	..			Small Intestine	2	+3		1	+1		1	..		..	..	
2	..		5	+6		..	..		..	..			Cæcum	5	..		4	+2		1	..		..	..	
4	..		7	+2		..	..		1	..			Colon	6	+10		7	+1		..	..		..	..	

5	..	..	..	2	−1	..	+1	[illegible]	[illegible]	..	..	+1	1	+1	..	..
2	+2	..	..	3	+1	1	..	Maxilla	4	..	1	..	2	+1	1	..
8	..	1	..	4	−1	1	..	Mandible	1	..	1	..	2	..	1	..
6	+1	5	..	..	+2	..	..	Palate	..	..	..	..	..	..	..	..
1	..	3	..	1	..	..	..	Tonsil	3	..	1	..	2	+3	1	..
1	..	2	..	..	+1 −2	2	..	Parotid	..	..	..	..	..	+1	..	..
1	..	..	..	1	..	..	..	Thyroid	3	+1	2	..	..	..	..	..
130	+1 −7	45	..	5	+1 −1	1	..	Breast	36	+5	21	..	2	..	..	..
..	+1	..	..	..	..	..	..	Vagina	1	+1	..	..	..	..	..	..
..	+1	..	+1	..	..	1	..	Uterus	15	+5	16	+4	1	+2	..	..
6	+2 −1	..	+3	..	..	..	..	Bladder	6	+4	2	+2	..	+1	..	..
..	..	1	+1	..	..	..	..	Urethra	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	Prostate	2	+6	..	+2	..	..	..	..
..	..	..	..	2	..	1	..	Ovary	13	+4	7	+4	5	+4	2	+3
1	..	..	..	..	+2	1	..	Testis	..	+1	2	..	4	..	1	..
2	+1	..	+1	..	..	1	..	Kidney	6	+2	6	+1	7	+2	1	..
..	..	..	..	..	..	..	..	Adrenal	..	..	..	..	1	+1	..	..
..	..	..	+2	2	..	..	..	Peritoneum	6	+1	4	..	3	+1	..	..
..	..	..	..	5	..	4	+1	Brain and Cord	..	..	..	..	20	+12 −1	20	+5
..	..	..	..	1	..	..	..	Orbit	1	+1	..	..	3	..	1	..
..	..	..	..	1	..	..	..	Sub-cutaneous	..	..	..	..	4	+1	4	..
..	..	..	..	1	+6	..	+3	Lung and Mediastinum	5	+11	5	+3	18	+7	12	+7
..	..	..	..	1	..	1	..	Lymphatic Glands: Cervical	..	..	..	..	1	+3	..	..
..	..	..	..	..	+1	..	+2	Tracheal	..	..	..	..	..	..	..	..
..	..	..	..	2	..	1	+1	Retro-peritoneal	..	..	..	..	4	..	1	..
..	..	..	..	..	..	..	..	Not specified	..	..	..	..	3	+2	1	..
..	..	..	..	1	..	1	..	Bones: Skull	..	..	..	..	2	+2	1	..
..	..	..	..	..	..	..	..	Spine	..	..	..	..	..	..	..	..
..	..	..	..	..	..	1	..	Sacrum	1	..	..	..	..	..	..	..
..	..	..	..	..	+1 −1	1	..	Sternum and Ribs	1	..	..	..	1	..	1	..
..	..	..	..	2	..	1	..	Scapula	..	..	..	..	..	..	..	..
..	..	..	..	..	+1	..	..	Clavicle	..	..	..	..	..	..	1	..
..	..	..	..	1	+1	1	..	Humerus	..	..	..	..	1	..	..	..
..	..	..	..	1	−2	1	..	Arm	..	..	..	..	..	..	..	..
..	..	..	..	..	+1	..	..	Annularis	..	..	..	..	..	..	..	..
..	..	..	..	2	..	3	..	Pelvis	..	..	..	..	9	..	2	..
..	..	..	..	16	+9	13	+2	Leg	..	..	..	..	5	+1	..	..
..	..	..	..	..	+1	..	..	Muscles: Trunk	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	Upper limb	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	Lower limb	..	..	..	..	..	+1	..	..
311	+22 −26	290	+44 −1	54	+28 −8	38	+10		338	+120 −2	312	+65	113	+48 −1	52	+15

APPENDIX B

Table 3

Cancer Blank of the New York State Department of Health

NEW YORK STATE DEPARTMENT OF HEALTH
BUREAU OF VITAL STATISTICS

Record of Death by Cancer

WITH ADDITIONAL INFORMATION FOR NEW YORK STATE CANCER RESEARCH STATISTICS

Full name..

Place of death..

Home or usual residence..

Sex....................Color or race.................... Single.................. Married................ Widowed............... Divorced...............

Date of birth..........................Date of death ....

Age..

Occupation. Nature of work..

Nature of industry or establishment in which employed........................

Birthplace..

How long resident of present locality..

Name of father..............................Birthplace of father...............

Maiden name of mother.......................Birthplace of mother..............

Name and address of informant..

....

Deceased died of cancer of..

Any other terminal or accessory disease..

Duration of cancer..

Duraticn of terminal disease..

Name of physician filing death certificate..

Address..

☞ *N. B. Please fill out blank lines above remaining unanswered from the death certificate and give additional information requested on back of form.* (OVER)

APPENDIX B

Table 3 (concluded)
Cancer Blank of the New York State Department of Health
(reverse)

Additional Data Requested

Vas there history of possible hereditary origin of the cancer.......................

Vas there history in the deceased of (yes or no) Tuberculosis.... Syphilis....
Alcoholism.... Other chronic illness (please name)..........................

Iad the patient suffered any trauma, ulcer, or other similar irritative condition which led up to and might have initiated the cancer (e. g., gastric ulcer, cervical tear, chronic mastitis, inveterate use of pipe or cigarette, pessary, single or multiple childbirth, etc.)...

f not clearly recorded in the death certificate please state to the best of your knowledge and belief:

a) Where did the primary growth arise?.......................................

b) When did this growth probably begin?.....................................

c) In what locality was patient when the growth began?........................

What was the first distinct symptom or sign?.....................................

Vere there metastases?...

Vas the diagnosis confirmed either before or after death by microscopic examination of the growth?..

f so, what was the pathological diagnosis?..

Vhat measures, medical or surgical, or both, were employed (e. g., X-ray, Radium, Toxins, Cautery, or Operative removal)?...................................

Vhat was the result of these measures?..

---

ote.—In your personal experience of the past 15 years can you refer to any person sons now living, having spontaneously recovered from an undoubted cancer, of which agnosis was confirmed by microscopic examination:

Name..

Address...

of physician answering above questions.......................................

ss...

APPENDIX B

Table 4

Question Form for International Cancer Statistics

Question-form[1]
for
International cancer statistics.

Name of the country, national committee..........................

Local board, office..

Census form for a death case from a cancer patient.[2]

Residence of the deceased...

Administrative district (country or province, etc.) ....

State..

A. General Report.

1. **Christian and surname** of the deceased (both the first initials of the Christian and surname):.................................

2. **Sex:** male? female?[3]

3. **Day of death:**...

4. **Age:** born on.....................................(if the day of birth not known, the age in completed years)...............

5. **Social state:** single? married? widowed? divorced?...............

6. **Nationality:**...

7. In what **profession** or **trade** was the deceased last and formerly employed (social position: independent? employer? workingman? servant? etc.):...

   In the case of female persons, besides her own vocation, that of the husband or father:..................................

8. *a* **Last residence:**...

   If the patient died in a hospital, the last residence before entering the same (street, house-number, story, front-house, back-premises, etc.)...

   b **Residence at the time of getting sick:**........................

[1] All questions which can not be positively answered with "yes" or "no" should receive the answer "uncertain."

[2] **As death from cancer is to be considered, every death case of a cancer patient, even though death resulted from another cause (suicide, apoplexy, etc.).**

[3] In women, the maiden name. Unappropriate questions here and elsewhere are to be crossed out.

Table 4 (concluded)
Question Form for International Cancer Statistics

B. Special Report.

9. Was the deceased **sick before?** and when?........................
with tuberculosis?..
" syphilis?..
" malaria?..
" alcoholism?..
" trauma?..
" (Ulcer of the stomach?)..............................
Was he vegetarian?..
In **women**
a with inflammations in the sphere of the genital organs?........
When?..
b In the case of uterine or vaginal cancer: was a pessary worn?............
c How many births and abortions occurred?..................
In the case of **lingual cancer** or **cancer of the mouth:** Was the deceased a smoker?....................(pipe? cigars? cigarettes?)
10. *a* Primary **seat and nature** of the cancer (was the diagnosis made with the aid of a microscopical examination? Yes. No.
By whom? What was the result?)........................
b Was the organ primarily affected by **previous sickness** or lesions? Did chronic inflammatory processes exist and which? In the case of relapses resp. metastases, where was the seat of the primary swelling?..
c Did the tumor grow on a basis of a benign tumor?.............
11. *a* When did the ailment apparently **commence?** The year......
(If possible, accurate date)................................
b Which was the **first distinct symptom?**......................
12. Was the malady treated **operatively** or locally with Roentgen, Radium, etc.?..
What was the **nature** of measures employed?..................
When were these measures employed?........................
What was the result of these measures on the **local** and on the **general condition** of the patient?..............................
Did **relapses** or **metastases** occur?..............................
where?..................when?..........................
13. **Immediate cause of death:**[1]..................................
14. Was an **autopsy** made? Yes. No. By whom?................
What was the **result** of this autopsy with reference to cancer?
....
Were **microscopical post-mortem examinations** undertaken?.......
By whom?..
What was the **result?**......................................
15. **Remarks:**..
Place:.........................Date:..........................
Signature (Stamp) (of the certifying physician)

[1] Suicide, pneumonia, etc.

APPENDIX B

Table 5

Question Form of the George Crocker Special Research Fund

DEPARTMENT OF PATHOLOGY

Cancer Schedule, No.........................

1. Attending Surgeon—Dr...

2. Place and date of record...

....

(State address of Attending Surgeon or name of hospital)

3. Name of patient or initials...

4. Sex.. 5. Age..

6. Single or married...

(If female, state whether patient had children or miscarriages)

7. Race or nationality...

(*Australioid* [Coolies of East India], *Negroid* [Negroes, Negritos of the Philippines], *Mongoloid* [Chinese, Japanese, American Indians, Philippinoes], *Melanochroic* [Italians, Spaniards, Greeks, Arabs, Jews], *Xanthochroic* [Fair Europeans]. State not only the name of the race, but also of the subdivision)

8. Place of birth...

(State not only the country but also the town or village where the patient was born)

9. Residence, etc...

10. Occupation...

(Pay special attention to occupation, involving use of *chemical* [anilin, paraffin, tar, etc.], *physical* [X-rays, radium, excessive heat, electricity, etc.], or *mechanical* irritants)

11. Diet...

....

(State whether the diet is composed chiefly of *vegetables, fresh fish, fresh meat, salted fish, salted meat*)

12. Habitual use of drugs...

(*Alcohol, tobacco* [chewing, smoking pipe or cigar], *opium* [opium smoking or morphium injection], *cocaine*)

13. Previous general diseases...

(*Tuberculosis, Lepra, Arterio-sclerosis, Syphilis, Gonorrhoea*, etc.)

14. When were the first symptoms of the disease observed?.........................

....

15. On what data or symptoms was the diagnosis made?.........................

....

(If the diagnosis was made at an operation, autopsy or microscopically, specify so and state the exact anatomical diagnosis)

16. What organ was primarily involved?...

....

Table 5 (concluded)
Question Form of the George Crocker Special Research Fund

17. Was the same organ previously diseased or subjected to trauma?

....

(As instances of such previous local diseases important in the study of the etiology of cancer may be mentioned *leucoplasia* of the tongue, *mastitis*, *lupus* of the face, *naevi*, *scars* or *leprous nodules* of the skin, *gallstones*, *round ulcer* of the stomach, *varicose ulcers*, *old fractures of bones* [osteo-sarcoma], etc.)

18. What organs became subsequently affected?..

....

19. Did any other tumor develop on the same patient?.............................

....

20. Were there any other cases of cancer in the patient's family?............

....

(The family may mean *grandparents*, *parents*, *brothers and sisters*, *man or wife*, *children*. State relationship to patient and organ primarily involved)

21. Were there any other cases of cancer in the same house or neighborhood?..

(State time, place, and organ primarily involved)

22. Was there a retrogression of the tumor?..

....

(After treatment—operation, X-ray, radium, fulguration—or spontaneously)

Remarks

The sources of cancer mortality data are briefly discussed in Chapter II.

APPENDIX B

Table 6

Uterine Cancer Blank of the American Society for the Control of Cancer

A. S. C. C.—Uterine Cancer Form—Sheet No. 1.

GENERAL MEMORIAL HOSPITAL

Ward............Room............History No............ Diagnosis............
Name.. Complications........
Address... Result.............
(Married. Single. Widowed.) Admitted......191
Age................. Discharged.....191
House Surgeon........................Attending Surgeon........................

Personal Data Race..........Nationality............Birthplace............

Occupation (work actually done)..

Family History

(Members with cancer or other uterine diseases)..............................

Causes of death in family..

Personal History

(Note previous illnesses)..

....

Uterine History

Menstruation: Onset..............Last..............Type..............

Recent data..

Gestations: Number............Date of first............last............

Character of labors..

Abortions..

(Date; report)...

Operations...

Other uterine data...

Present Illness

First symptoms (date, etc.)..

Hemorrhage...

Pain...

Change in discharge..

Description of tumor...

Exact location...

Form...

Size...

Mobility...

Parametrium..

Lymph nodes..

Vagina...

Bladder..

Rectum...

Table 6 (concluded)
Uterine Cancer Blank of the American Society for the Control of Cancer

A. S. C. C.—Uterine Cancer Form—Sheet No. 2.

GENERAL MEMORIAL HOSPITAL

Operative History

(State exact tissues removed)..

....

....

....

....

Later History

Recurrences...

Local..

Regional..

Remote..

Cachexia..

Cause of death..

Present condition (date)..

Pathological Report

Gross:..

Cervix..

Fundus..

Parametrium...

Vagina..

Microscopical: (give details of structure).............................

Epidermoid carcinoma...

Adenocarcinoma...

Carcinoma...

Sarcoma...

Chorioma..

Autopsy Report (date)..

Recurrence..

Local..

Regional..

Remote..

Other Data

....

....

....

NOTE.—This blank was prepared under the direction of a special committee of the American Society for the Control of Cancer, Dr. James Ewing, chairman, and recommended for universal adoption.

APPENDIX B

Table 7

Buccal Cavity Cancer Blank of the American Society for the Control of Cancer

A. S. C. C.—Form S4—First Sheet (BUCCAL, LABIAL, LINGUAL, TONSILLAR CANCER)

GENERAL MEMORIAL HOSPITAL

Ward............Room............History No............. Diagnosis............
Name.. Complications........
Address... Result..............
(Married. Single. Widowed.) Admitted........191
Age.................. Discharged.....191
House Surgeon....................Attending Surgeon..........................
Personal Data Race..........Nationality............Birthplace...............
Occupation (state exact kind of work performed)................................

Family History

(Members with cancer or other buccal diseases)...................................

Causes of death in family..

Personal History

(Note previous illnesses)..

....

Buccal History

Conformation of lips, tongue, tonsils......................................
Alcohol...............................Tobacco.............................
Dental history and condition..
Nasal history...
Aural history...
Tonsillar history...
Syphilis: Leukoplakia...
Trauma..

Present Illness

First symptoms (date, etc.)...
General Status..
Description of tumor..
Exact location..
Form..
Size..
Depth...
Mobility..
Ulceration..
Lymph nodes...
Bone invasion...
Blood vessels...

Table 7 (concluded)

Buccal Cavity Cancer Blank of the American Society for the Control of Cancer

A. S. C. C.—Form S4—Second Sheet (BUCCAL, LABIAL, LINGUAL, TONSILLAR CANCER)

GENERAL MEMORIAL HOSPITAL

Operative History

(State exact tissues removed or treatment) ....

....

....

....

....

Later History

Recurrences ....

Local ....

Regional ....

Remote ....

Cachexia ....

Sepsis ....

Cause of death ....

Present condition (date) ....

Pathological Report

Gross: ....

Type of ulcer ....

Infiltration ....

Suppuration ....

Outlying mucosa ....

Lymph nodes ....

Microscopical: (give details of structure) ....

Epidermoid carcinoma ....

Adenocarcinoma ....

Glandular Carcinoma ....

Basal cell carcinoma ....

Autopsy Report (date) ....

Recurrence ....

Local ....

Regional ....

Remote ....

Other Data

....

....

....

NOTE.—This blank was prepared under the direction of a special committee of the American Society for the Control of Cancer, Dr. James Ewing, chairman, and recommended for universal adoption.

APPENDIX B

Table 8

Mammary Cancer Blank of the American Society for the Control of Cancer

A. S. C. C.—Form S2—First Sheet (MAMMARY CANCER)

GENERAL MEMORIAL HOSPITAL

Ward............Room............History No............. Diagnosis............
Name.. Complications........
Address.. Result.............
(Married. Single. Widowed.) Admitted.......191
Age.................. Discharged.....191
House Surgeon........................Attending Surgeon........................

Personal Data Race..........Nationality............Birthplace................
Occupation (state exact kind of work performed)....................................

Family History
(Members with cancer or
other mammary diseases)...
Causes of death in family...

Personal History
(Note previous illnesses)...
....

Mammary History
Type of gland: Large..............Small...............Adipose..............
Lactations: Number..............Date of first..............Last............
Duration...........................Flow of milk..........................
Character of Nipples...
Mastitis..............Cysts.................Nodules...................
Abscess and residual induration...
Trauma.............Date..................Location.....................
Character...
Previous Tumor...
State of other Breast..

Present Illness
(First symptoms, character and date)..................................
Pain..
Nutrition: Anemia...

Description of Tumor
Exact location...
Form..
Size (cm.)...
Nipple: Retraction.............Fixation.............Discharge.............
Skin: Fixation......................Surface..........................
Mobility..
Mobility of Muscle...
Lymph nodes: Axillary..
Epigastric.........................Supraclavicular...................
Rate of Growth...

Table 8 (concluded)
Mammary Cancer Blank of the American Society for the Control of Cancer

A. S. C. C.—Form S2—Second Sheet (MAMMARY CANCER)

GENERAL MEMORIAL HOSPITAL

Operative History
(State exact tissues removed)..
....
....
....
....

Later History
Recurrences..
Local..
Regional..
Remote..
Cachexia..
Cause of Death..
Present condition (date)..

Pathological Report
Gross:..
Lymph nodes..
Muscle..
Skin..
Fascia between muscle and breast..
Microscopical: (give details of structure)..
Adenoma..
Adenocarcinoma..
Carcinoma { alveolar..
diffuse..
Sarcoma..
Remainder of breast..

Autopsy Report (date)..
Recurrence..
Local..
Regional..
Remote..
Bones..
Mode of extension..

NOTE.—This blank was prepared under the direction of a special committee of the American Society for the Control of Cancer, Dr. James Ewing, chairman, and recommended for universal adoption.

APPENDIX B

Table 9

Gastric Cancer Blank of the American Society for the Control of Cancer

A. S. C. C.—Form S3—First Sheet (GASTRIC CANCER)

GENERAL MEMORIAL HOSPITAL

Ward............Room............History No............. Diagnosis............
Name.. Complications.......
Address... Result..............
(Married. Single. Widowed.) Admitted.......191
Age.................. Discharged.....191
House Surgeon.......................Attending Surgeon........................

Personal Data Race..........Nationality............Birthplace...............

Occupation (State exact kind of work performed)...................................

Family History

(Members with cancer or other gastric diseases).....................................

Causes of death in family...

Personal History

(Note previous illnesses including all signs of tumors)...........................

....

Alcoholism..

Usual state of nutrition..

Gastric History

Attacks of gastritis...

Indigestion: Pain..............Time of onset............Mode of relief..........

Athletic Stomach?..

Jaundice...

Signs of ulcer..

Favorite diets..

Gastric analysis (old)...

Trauma...

Present Illness

(Give first symptoms, date, etc.)..

Any definite cause...

Were early signs persistent..

Pain: Time of onset......................Mode of relief......................

Vomiting and vomitus...

Local tumor..

Loss of weight (date, etc.)..

Gastric analyses...

Stools (Gross and Mx.)...

Gastroscopic signs...

X-Ray..

General status...

Table 9 (concluded)
Gastric Cancer Blank of the American Society for the Control of Cancer

A. S. C. C.—Form S3—Second Sheet (GASTRIC CANCER)

GENERAL MEMORIAL HOSPITAL

Operative History
(State exact tissues removed or involved)..................................
Anastomosis..................................
Fistula..................................
....
....
....

Later History
Digestion..................................
Nutrition..................................
Recurrence..................................
Local..................................
Regional..................................
Remote..................................
Cachexia..................................
Cause of Death..................................
Present condition (date)..................................

Pathological Report
Gross:..................................
Pylorus..................................
Fundus..................................
Cardia..................................
Peritoneum..................................
Lymph nodes..................................
Microscopical: Adenocarcinoma (give details of structure)..................................
Fibro-Carcinoma..................................
Diffuse carcinoma..................................
Gelatinous carcinoma..................................
Linitis plastica..................................
Lymph nodes..................................

Autopsy Report (date)..................................
Description of organ..................................
Recurrence..................................
Local..................................
Regional..................................
Remote..................................
Paths of dissemination..................................

Other Data
....
....
....

NOTE.—This blank was prepared under the direction of a special committee of the American Society for the Control of Cancer, Dr. James Ewing, chairman, and recommended for universal adoption.

APPENDIX B

Table 10

Supplementary Letter of Inquiry on Statistics of Cancer of the Division of Vital Statistics of the United States Census

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OFFICE OF
THE DIRECTOR

DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
WASHINGTON

Dear Doctor:

At the request of the American Society for the Control of Cancer the Bureau of the Census has decided to publish two sets of statistics covering the subject of deaths from cancer and other malignant tumors:

(a) Statistics of deaths in which the diagnoses were based on clinical findings.

(b) Statistics of deaths in which the diagnoses were confirmed by autopsies, or in which surgical operations were performed.

Will you kindly examine the accompanying transcript of a medical certificate of death, the original of which was made out by you, and note thereon whether the diagnosis was based on CLINICAL FINDINGS or AUTOPSY; also whether there was SURGICAL INTERVENTION? In either case the SEAT OF THE DISEASE should also be stated. Any further data which you care to give may be written on the reverse side of the transcript.

The information will be treated as strictly confidential and used for statistical purposes only. I feel assured that your interest in advancing the scientific study of this subject will prompt you to aid the Bureau in this great work, the success of which is entirely dependent upon the cooperation of American physicians.

Prompt return of the information desired, by means of inclosed penalty envelope which requires no postage, will be greatly appreciated, as we are now compiling these returns.

Very respectfully,

SAM. L. ROGERS,
Director.

Inclosures.

APPENDIX

C

Mortality from Cancer in Different Occupations

Table — Page

1 England and Wales, by Age, Males, 1890-1892 306
2 England and Wales, by Age, Males, 1900-1902 308
3 England and Wales, Crude and Standardized Rates, Ages 15 and over, Males, 1890-1892 310
4 England and Wales, Crude and Standardized Rates, Ages 15 and over, Males, 1900-1902 311
5 England and Wales, Males, Standardized Rates, 1890-1892 Compared with 1900-1902 312
6 Industrial Experience of The Prudential Insurance Company of America, Per Cent. of All Causes, Ages 35 and over, 1907-1912 313
7 Hungary, 1904, Cancer Census of Cases, Ages 15 and over, Males 315
8 Hungary, 1901-1904, Death Rates, Ages 15 and over, Males 315

APPENDIX C

Table 1

Mortality from Cancer in England and Wales in Selected Occupations according to Age, Males, 1890-1892

	35-44 YEARS OF AGE			45-54 YEARS OF AGE		
	No. of Persons	Deaths from Cancer	Rate per 100,000 Population	No. of Persons	Deaths from Cancer	Rate per 100,000 Population
All males	4,833,231	1,769	36.6	3,575,367	4,204	117.6
Occupied males	4,714,230	1,644	34.9	3,426,093	3,856	112.5
Occ. males, industrial dists.	1,072,512	422	39.3	732,954	902	123.1
Occ. males, agricultural dists.	641,097	204	31.8	528,117	479	90.7
Unoccupied males	119,001	125	105.0	149,274	348	233.1
Clergymen	26,256	8	30.5	23,487	19	80.9
Lawyers	16,587	7	42.2	9,537	19	199.2
Physicians	14,481	3	20.7	9,840	10	101.6
School-teachers	23,994	6	25.0	15,093	12	79.5
Domestic indoor servants	21,588	4	18.5	12,684	14	110.4
Ry. eng. drivers and stokers	24,819	4	16.1	11,433	12	105.0
Seamen	68,172	33	48.4	48,240	64	132.7
Farmers and graziers	140,472	43	30.6	141,129	112	79.4
Farm laborers	311,364	105	33.7	284,427	245	86.1
Gardeners and nurserymen	90,810	27	29.7	80,409	71	88.3
Tobacconists	8,451	4	47.3	5,481	10	182.4
Fishermen	13,965	4	28.6	9,510	14	147.2
Maltsters	6,261	5	79.9	5,019	7	139.5
Brewers	18,069	10	55.3	12,633	24	190.0
Innkeepers	62,094	27	43.5	56,034	73	130.3
Grocers	58,374	14	24.0	42,891	30	69.9
Coal-merchants	18,699	7	37.4	16,212	19	117.2
Ironmongers	10,338	6	58.0	6,828	1	14.6
Printers	34,926	16	45.8	19,530	21	107.5
Butchers	46,926	28	59.7	29,931	33	110.3
Corn-millers	12,756	7	54.9	10,263	10	97.4
Bakers	42,981	19	44.2	29,898	33	110.4
Hatters	8,727	2	22.9	5,010	3	59.9
Tailors	61,002	21	34.4	47,943	58	121.0
Shoemakers	96,321	42	43.6	87,405	108	123.6
Tanners	6,402	..	..	4,761	4	84.0
Metal-workers	405,633	156	38.5	278,109	333	119.7
Carpenters and joiners	139,701	41	29.3	105,012	105	100.0
Textile-workers	175,263	57	32.5	121,398	133	109.6
Potters	17,061	2	11.7	11,451	12	104.8
Glass-workers	11,634	6	51.6	6,876	12	174.5
Coal-miners	265,098	61	23.0	162,981	129	79.2
Quarrymen	33,120	16	48.3	24,045	41	170.5
Gas-works service	25,053	16	63.9	15,654	22	140.5
Chimney-sweeps	5,634	7	124.2	3,945	21	532.3

Source: Supplement to the Fifty-fifth Report of the Registrar-General of England and Wales, 1881-1890, Vol. II.

APPENDIX C

Table 1 (concluded)

rtality from Cancer in England and Wales in Selected Occupations according to Age, Males, 1890-1892

	55-64 YEARS OF AGE			65 YEARS AND OVER		
	No. of Persons	Deaths from Cancer	Rate per 100,000 Population	No. of Persons	Deaths from Cancer	Rate per 100,000 Population
es	2,310,372	6,381	276.2	1,819,764	8,401	461.7
ed males	2,072,076	5,408	261.0	1,178,679	5,726	485.8
les, industrial dists.	394,914	1,080	273.5	166,317	762	458.2
les, agricultural dists.	386,241	949	245.7	292,242	1,443	493.8
pied males	238,296	973	408.3	641,085	2,675	417.3
nen	17,556	34	193.7	16,017	70	437.0
s	5,913	19	321.3	4,260	16	375.6
ans	5,562	16	287.7	5,676	37	651.9
teachers	6,435	17	264.2	2,235	11	492.2
ic indoor servants	6,105	14	229.3	2,604	22	844.9
. drivers and stokers	4,098	14	341.6	693	5	721.5
	21,699	81	373.3	8,631	76	880.5
s and graziers	124,830	286	229.1	106,392	516	485.0
borers	244,245	512	209.6	202,401	861	425.4
ers and nurserymen	64,407	145	225.1	50,121	223	444.9
onists	3,384	8	236.4	1,266	6	473.9
ien	6,003	15	249.9	4,056	32	789.0
rs	2,607	8	306.9	1,134	8	705.5
s	6,576	27	410.6	2,688	18	669.6
pers	33,117	103	311.0	14,877	84	564.6
	29,580	65	219.7	18,099	61	337.0
erchants	11,895	27	227.0	6,579	39	592.8
ngers	3,957	13	328.5	1,851	9	486.2
s	8,874	24	270.5	3,645	12	329.2
rs	16,134	62	384.3	7,959	46	578.0
illers	6,618	18	272.0	3,333	19	570.1
	17,628	47	266.6	8,589	37	430.8
	2,688	10	372.0	1,599	11	687.9
	35,280	96	272.1	26,103	113	432.9
kers	63,036	184	291.9	44,589	203	455.3
s	2,868	8	278.9	1,530	6	392.2
workers	139,524	384	275.2	56,937	328	576.1
ters and joiners	60,774	177	291.2	34,620	183	528.6
-workers	74,013	185	250.0	37,149	176	473.8
	5,031	11	218.6	1,716	9	524.5
orkers	2,994	7	233.8	1,044	4	383.1
iners	80,403	201	250.0	25,677	105	408.9
men	13,185	41	311.0	5,475	39	712.3
rks service	6,771	23	339.7	2,244	21	935.8
ey-sweeps	2,151	17	790.3	1,125	16	1,422.2

APPENDIX C

Table 2

Mortality from Cancer in England and Wales in Selected Occupations according to Age, Males, 1900-1902

	35-44 YEARS OF AGE			45-54 YEARS OF AGE		
	No. of Persons	Deaths from Cancer	Rate per 100,000 Population	No. of Persons	Deaths from Cancer	Rate per 100,000 Population
All males	5,795,829	2,311	39.9	4,188,627	6,063	144.7
Occupied males	5,668,233	2,220	39.2	4,024,074	5,701	141.7
Occ. males, industrial dists.	1,511,544	687	45.5	1,051,485	1,621	154.2
Occ. males, agricultural dists.	784,014	220	28.1	610,221	699	114.5
Unoccupied males	127,596	91	71.3	164,553	362	220.0
Clergymen	29,556	7	23.7	25,275	23	91.0
Lawyers	19,686	8	40.6	13,869	22	158.6
Physicians	21,405	9	42.0	12,366	15	121.3
School-teachers	42,138	9	21.4	19,464	24	123.3
Domestic indoor servants	24,828	6	24.2	14,625	25	170.9
Ry. eng. drivers and stokers	35,616	10	28.1	22,962	21	91.5
Seamen	61,335	46	75.0	43,698	104	238.0
Farmers and graziers	160,149	44	27.5	143,787	146	101.5
Farm laborers	263,655	80	30.3	215,895	233	107.9
Gardeners and nurserymen	111,882	43	38.4	98,877	92	93.0
Tobacconists	10,776	6	55.7	7,614	11	144.5
Fishermen	14,940	4	26.8	10,896	19	174.4
Maltsters	6,732	2	29.7	4,752	5	105.2
Brewers	18,720	14	74.8	12,531	30	239.4
Innkeepers	75,801	30	39.6	61,086	82	134.2
Grocers	70,440	25	35.5	45,927	51	111.0
Coal-merchants	21,756	3	13.8	18,183	22	121.0
Ironmongers	13,893	3	21.6	9,387	6	63.9
Printers	48,465	15	31.0	28,542	39	136.6
Butchers	56,697	19	33.5	34,266	48	140.1
Corn-millers	14,553	4	27.5	10,665	22	206.3
Bakers	54,450	24	44.1	33,645	49	145.6
Hatters	9,006	2	22.2	6,306	10	158.6
Tailors	77,061	34	44.1	51,510	79	153.4
Shoemakers	103,839	41	39.5	77,217	120	155.4
Tanners	5,550	2	36.0	4,314	2	46.4
Metal-workers	521,619	197	37.8	371,985	508	136.6
Carpenters and joiners	147,279	56	38.0	120,978	161	133.1
Textile-workers	200,073	95	47.5	130,515	192	147.1
Potters	20,043	8	39.9	12,894	21	162.9
Glass-workers	13,167	3	22.8	9,030	13	144.0
Coal-miners	345,939	112	32.4	224,634	232	103.3
Quarrymen	43,467	16	36.8	33,705	35	103.8
Gas-works service	38,718	10	25.8	24,918	37	148.5
Chimney-sweeps	5,079	6	118.1	4,536	13	286.6

Source: Supplement to the Sixty-fifth Report of the Registrar-General of England and Wales, 1900-1902, Vol. II.

APPENDIX C

Table 2 (concluded)

·tality from Cancer in England and Wales in Selected Occupations according to Age, Males, 1900-1902

	55-64 YEARS OF AGE			65 YEARS AND OVER		
	No. of Persons	Deaths from Cancer	Rate per 100,000 Population	No. of Persons	Deaths from Cancer	Rate per 100,000 Population
s..................	2,723,835	9,867	362.2	1,983,216	12,658	638.3
l males............	2,424,456	8,027	331.1	1,202,520	8,038	668.4
es, industrial dists...	575,952	1,982	344.1	218,604	1,400	640.4
es, agricultural dists.	447,492	1,243	277.8	313,359	2,118	675.9
›ied males..........	299,379	1,840	614.6	780,696	4,620	591.8
en................	20,238	61	301.4	17,493	102	583.1
....	6,741	26	385.7	4,296	27	628.5
ns................	7,239	31	428.2	5,367	31	577.6
eachers............	9,789	26	265.6	2,082	26	1,248.8
c indoor servants....	7,170	24	334.7	2,499	16	640.3
drivers and stokers	8,739	24	274.6	1,257	20	1,591.1
....	23,928	118	493.1	8,130	109	1,340.7
and graziers.......	126,306	368	291.4	101,595	674	663.4
›orers.............	181,137	416	229.7	150,189	825	549.3
rs and nurserymen..	79,524	193	242.7	60,837	363	596.7
nists..............	4,431	9	203.1	2,064	16	775.2
en................	7,035	23	326.9	3,990	33	827.1
s..................	2,691	10	371.6	1,095	9	821.9
....	6,744	43	637.6	2,535	25	986.2
ers................	36,684	133	362.6	14,403	116	805.4
....	29,961	81	270.4	16,806	74	440.3
rchants............	13,323	30	225.2	7,152	52	727.1
gers..............	5,190	21	404.6	2,601	15	576.7
....	13,752	47	341.8	4,383	28	638.8
....	17,688	72	407.1	7,230	52	719.2
lers..............	6,825	24	351.6	3,675	20	544.2
....	19,653	74	376.5	8,844	46	520.1
....	3,225	11	341.1	1,257	9	716.0
....	34,008	141	414.6	22,530	153	679.1
ers................	61,776	210	339.9	40,899	256	625.9
....	2,559	5	195.4	1,185	11	928.3
orkers.............	203,892	720	353.1	71,052	539	758.6
ers and joiners......	78,063	255	326.7	38,382	254	661.8
vorkers............	72,087	259	359.3	30,864	261	845.6
....	6,408	19	296.5	2,055	10	486.6
rkers.............	4,374	14	320.1	1,290	12	930.2
ners...............	107,454	300	279.2	30,003	201	669.9
nen................	19,206	59	307.2	7,683	56	728.9
ks service..........	12,393	52	419.6	3,798	28	737.2
-sweeps...........	2,724	18	660.8	1,146	19	1,657.9

APPENDIX C

Table 3

Mortality from Cancer in England and Wales in Selected Occupations, Males, Crude and Standardized Death Rates, Ages 15 and Over, 1890-1892

	Recorded Death Rate from Cancer per 100,000 Population	Standardizing Factor	Standardized Death Rate from Cancer per 100,000 Population
All males	80.5	1.0000	80.5
Occupied males	68.5	1.1467	78.5
Occupied males in industrial districts	60.7	1.3350	81.0
Occupied males in agricultural districts	84.9	0.8866	75.3
Unoccupied males	276.8	0.3232	89.5
Clergymen	122.3	0.5502	67.3
Lawyers	101.8	0.8807	89.7
Physicians	119.7	0.7638	91.4
School-teachers	36.7	1.9398	71.2
Domestic indoor servants	38.7	2.1129	81.8
Railway engine drivers and stokers	31.8	2.2837	72.6
Seamen	85.6	1.3262	113.5
Farmers and graziers	120.3	0.6062	72.9
Farm laborers	80.7	0.8248	66.6
Gardeners and nurserymen	93.4	0.7406	69.2
Tobacconists	74.4	1.1697	87.0
Fishermen	93.1	1.0849	101.0
Maltsters	107.4	1.0160	109.1
Brewers	106.7	1.1354	121.1
Innkeepers	131.1	0.7105	93.1
Grocers	46.8	1.2385	58.0
Coal-merchants	115.2	0.7365	84.8
Ironmongers	51.2	1.4073	72.1
Printers	36.9	2.0942	77.3
Butchers	64.1	1.5160	97.2
Corn-millers	82.0	1.0075	82.6
Bakers	55.5	1.4208	78.9
Hatters	57.8	1.4583	84.3
Tailors	84.0	0.9111	76.5
Shoemakers	95.5	0.8697	83.1
Tanners	62.6	1.0216	64.0
Metal-workers	60.7	1.4049	85.3
Carpenters and joiners	80.0	1.0037	80.3
Textile-workers	54.1	1.3927	75.3
Potters	37.6	1.6958	63.8
Glass-workers	51.8	1.8660	96.7
Coal-miners	36.3	1.6919	61.4
Quarrymen	96.0	1.1145	107.0
Gas-works service	91.4	1.2452	113.8
Chimney-sweeps	265.9	0.9984	265.5

Source: Supplement to the Fifty-fifth Report of the Registrar-General of England and Wales, 1881-1890, Vol. II.

APPENDIX C

Table 4

lity from Cancer in England and Wales in Selected Occupations, Males, rude and Standardized Death Rates, Ages 15 and Over, 1900-1902

	Recorded Death Rate from Cancer per 100,000 Population	Standardizing Factor	Standardized Death Rate from Cancer per 100,000 Population
s	101.9	1.0185	103.8
d males	84.7	1.1919	101.0
d males in industrial districts	77.1	1.3341	102.9
d males in agricultural districts	103.4	0.8921	92.2
pied males	373.7	0.3207	119.8
nen	163.1	0.5353	87.3
s	131.8	0.8486	111.8
ans	127.5	0.7928	101.1
teachers	52.5	1.7157	90.1
ic indoor servants	43.9	2.1240	93.2
/ engine drivers and stokers	41.9	2.0349	85.3
	136.3	1.2508	170.5
s and graziers	146.4	0.6477	94.8
borers	96.6	0.8254	79.7
ers and nurserymen	116.1	0.7336	85.2
onists	83.4	1.1438	95.4
ien	115.0	0.9728	111.9
rs	94.2	1.0782	101.6
	137.7	1.2101	166.6
ers	144.6	0.7521	108.8
	56.3	1.3580	76.5
rchants	115.0	0.7456	85.7
igers	64.0	1.3586	87.0
	50.8	1.8295	92.9
s	63.0	1.6319	102.8
illers	107.9	0.9758	105.3
	69.2	1.4349	99.3
	74.0	1.3653	101.0
	104.6	1.0791	112.9
kers	113.3	0.9109	103.2
	70.9	1.1026	78.2
orkers	73.2	1.3815	101.1
ers and joiners	93.4	1.0448	97.6
workers	81.8	1.3770	112.6
	56.8	1.6014	91.0
orkers	59.5	1.6958	100.9
ners	50.3	1.6372	82.4
nen	80.8	1.1289	91.2
ks service	93.7	1.1428	107.1
y-sweeps	280.6	0.8016	224.9

ce: Supplement to the Sixty-fifth Report of the Registrar-General of England les, 1900-1902, Vol. II.

APPENDIX C

Table 5

Mortality from Cancer in England and Wales in Selected Occupations
Males, Ages 15 and Over—Standardized Death Rates
1890-1892 Compared with 1900-1902

	Standardized Death Rates from Cancer per 100,000 Population		Increase per 100,000 Population
	1890-1892	1900-1902	
All males	80.5	103.8	23.3
Occupied males	78.5	101.0	22.5
Occupied males in industrial districts	81.0	102.9	21.9
Occupied males in agricultural districts	75.3	92.2	16.9
Unoccupied males	89.5	119.8	30.3
Chimney-sweeps	265.5	224.9	−40.6
Brewers	121.1	166.6	45.5
Gas-works service	113.8	107.1	− 6.7
Seamen	113.5	170.5	57.0
Maltsters	109.1	101.6	− 7.5
Quarrymen	107.0	91.2	−15.8
Fishermen	101.0	111.9	10.9
Butchers	97.2	102.8	5.6
Glass-workers	96.7	100.9	4.2
Innkeepers	93.1	108.8	15.7
Physicians	91.4	101.1	9.7
Lawyers	89.7	111.8	22.1
Tobacconists	87.0	95.4	8.4
Metal-workers	85.3	101.1	15.8
Coal-merchants	84.8	85.7	0.9
Hatters	84.3	101.0	16.7
Shoemakers	83.1	103.2	20.1
Corn-millers	82.6	105.3	22.7
Domestic indoor servants	81.8	93.2	11.4
Carpenters and joiners	80.3	97.6	17.3
Bakers	78.9	99.3	20.4
Printers	77.3	92.9	15.6
Tailors	76.5	112.9	36.4
Textile-workers	75.3	112.6	37.3
Farmers and graziers	72.9	94.8	21.9
Railway engine drivers and stokers	72.6	85.3	12.7
Ironmongers	72.1	87.0	14.9
School-teachers	71.2	90.1	18.9
Gardeners and nurserymen	69.2	85.2	16.0
Clergymen	67.3	87.3	20.0
Farm laborers	66.6	79.7	13.1
Tanners	64.0	78.2	14.2
Potters	63.8	91.0	27.2
Coal-miners	61.4	82.4	21.0
Grocers	58.0	76.5	18.5

Source: Supplements to the Fifty-fifth and Sixty-fifth Reports of the Registrar-General of England and Wales. (1881-1890, Vol. II., and 1900-1902, Vol. II.)

APPENDIX C

Table 6

dustrial Mortality Experience of The Prudential Insurance Company of America

ality from Cancer by Occupation, Ages 35 and Over, Males, 1907-1912

	Deaths from All Causes	Deaths from Cancer	Per Cent. of All Causes
les (35 years and over)	133,175	7,295	5.48
cupied males (35 years and over)	121,637	6,756	5.55
upied Males	7,107	320	4.50
d	4,197	211	5.03
rs and planters	5,589	388	6.94
ners	1,210	102	8.43
men and oystermen	255	17	6.67
niners	2,171	81	3.73
s	216	5	2.31
workers	368	21	5.71
e and stone-workers	675	36	5.33
ng-workers (tailors)	1,748	131	7.49
rs	411	16	3.89
s	901	57	6.33
s	173	6	3.47
moulders	1,004	54	5.38
her iron and steel-workers	2,657	134	5.04
nd boat builders	227	17	7.49
n-makers and wheelwrights	422	30	7.11
ss-makers	322	19	5.90
rs	266	16	6.02
rs and maltsters	225	13	5.78
sterers	237	20	8.44
rs	183	14	7.65
rs	643	39	7.07
rs	282	23	8.16
iths	596	28	4.70
makers	164	10	6.10
inders	143	8	5.59
rs and lithographers	1,103	36	3.26
e-workers	1,651	103	6.24
makers	838	52	6.21
ical workers	418	10	2.39
r-workers	132	8	6.06
smiths	1,782	124	6.96
rs and contractors	537	33	6.15
nters	6,478	416	6.42
s	2,088	131	6.27
rs	3,445	148	4.30
hangers	191	4	2.09
rers	507	36	7.10
rs	200	7	3.50
makers	2,073	121	5.84
akers	129	7	5.43
eers, not specified	1,797	142	7.90
en, not specified	670	36	5.37
nen, not specified	655	34	5.19
ers, not specified	28,949	1,512	5.22
inists	2,367	139	5.87
peratives, not specified	903	49	5.43

Table 6 (concluded)

Industrial Mortality Experience of The Prudential Insurance Company of America

Mortality from Cancer by Occupation, Ages 35 and Over, Males, 1907-1912

	Deaths from All Causes	Deaths from Cancer	Per cent. of All Causes
Plumbers and fitters	1,005	48	4.78
Sea captains and pilots	250	17	6.80
Boatmen	360	22	6.11
Sailors	208	13	6.25
Longshoremen and stevedores	387	17	4.39
Street-cleaners	188	10	5.32
Hostlers and stablemen	822	39	4.74
Draymen, teamsters and drivers	5,781	238	4.12
Street-railway employees	566	28	4.95
Railroad engineers and firemen	158	8	5.06
All other railroad employees	2,377	118	4.96
Mail-carriers	154	3	1.95
Insurance agents	396	27	6.82
Butchers and meat-dealers	1,359	80	5.89
Coal-dealers	138	17	12.32
Grocers	816	50	6.13
Liquor-dealers	165	6	3.64
Canvassers and collectors	619	41	6.62
Peddlers	667	38	5.70
Salesmen	1,594	81	5.08
Undertakers	168	6	3.57
Clerks, bookkeepers, etc	3,661	158	4.32
Policemen	453	31	6.84
Watchmen	2,336	148	6.34
Clergymen	125	10	8.00
Editors and journalists	101	10	9.90
Musicians	291	17	5.84
Physicians	177	12	6.78
Teachers	141	16	11.35
Barbers	934	49	5.25
Bartenders	1,161	35	3.01
Coachmen and chauffeurs	319	15	4.70
Cooks	445	19	4.27
Elevator-tenders	148	11	7.43
Janitors	1,115	89	7.98
Laundrymen	116	10	8.62
Porters	581	32	5.51
Hotel-keepers	425	19	4.47
Restaurant-keepers	259	13	5.02
Saloon-keepers	873	50	5.73
Waiters	468	19	4.06

Table 7

er Census of Hungary, 1904—Cases of Cancer, by Occupation, Males

	Number of Males over 15 Years of Age Census of 1900	Cancer Cases per 100,000 Population
›n laborers	169,103	136.6
rs (employers)	11,242	115.7
›rce (employers)	78,756	92.7
s (employers)	10,840	73.8
nillers (employers)	12,097	66.1
pers (employers)	24,620	56.9
(employers)	25,122	47.5
›rce (employees)	23,538	46.7
nith (employers)	33,860	41.3
ortation (employees)	76,962	37.7
ıkers (employers)	57,433	34.8
ters and cabinet-makers (employers)	45,892	32.7
tic servants	29,163	30.9
and smelters	48,756	30.8
service (employees)	45,571	26.3
›s (small farms)	1,953,621	22.6
s	443,383	12.0
nills (employees)	24,089	8.7
aborers	908,503	5.9
ıkers (employees)	37,538	5.3
ıters and cabinet-makers (employees)	59,624	5.0

Table 8

ortality from Cancer in Hungary, by Occupation, Males, 1901-1904

	Number of Males over 15 Years of Age Census of 1900	Deaths from Cancer per 100,000 Population
›s	14,356	238.6
pers (employers)	24,620	167.6
rs (employers)	11,242	129.0
›rce (employers)	78,756	119.0
ıters and cabinet-makers (employers)	45,892	115.5
service (employees)	45,571	114.7
(employers)	25,122	114.5
ıkers (employers)	57,433	110.1
miths (employers)	33,860	108.5
s (employers)	10,840	96.9
›n laborers	169,103	86.6
ys (employees)	53,581	83.1
nillers (employers)	12,097	76.5
s (employees)	44,954	60.1
aborers	908,503	54.7
›rce (employees)	23,538	51.0
ıters and cabinet-makers (employees)	59,624	47.0
tic servants	29,163	44.6
nills (employees)	24,089	43.3
and smelters	48,756	42.0
›s (small farms)	1,953,621	41.0
(employees)	23,139	32.4
s	443,383	26.0
miths (employees)	65,242	24.9

ırce: Ungarische Statistische Mitteilungen. Neue Serie, 19 Band. Statistik ›ebskranken in den Ländern der Ungarischen Heiligen Krone. Von Dr. Julius ger, Budapest, 1908.

APPENDIX

D

Cancer Mortality Statistics of American and Foreign Life Insurance Companies

The Prudential Insurance Company of America

Table	Period		Title	Page
1	1891-1913	Industrial Experience	Persons	321
2	1891-1913	Industrial Experience	By Sex	322
3	1909-1913	Industrial Experience	Proportion to All Causes, by Age and Sex	323
4	1909-1912	Industrial Experience	Sarcoma and Other Forms of Cancer, by Age	323
5	1909-1912	Industrial Experience	Sarcoma and Other Forms of Cancer, by Age and Sex	324
6	1909-1913	Industrial Experience	Cancer, by Organs and Parts and Sex, Average Age at Death	324
7	1909-1912	Industrial Experience	Sarcoma, by Organs and Parts and Sex, Average Age at Death	325
8	1909-1913	Industrial Experience	By Sex and Single Years of Life	326
9	1909-1913	Industrial Experience	Buccal Cavity, by Sex and Single Years of Life	328
10	1909-1913	Industrial Experience	Stomach and Liver, by Sex and Single Years of Life	330
11	1909-1913	Industrial Experience	Peritoneum, Intestines and Rectum, by Sex and Single Years of Life	332
12	1909-1913	Industrial Experience	Female Generative Organs, by Single Years of Life	334
13	1909-1913	Industrial Experience	Breast, by Sex and Single Years of Life	335
14	1909-1913	Industrial Experience	Skin, by Sex and Single Years of Life	337
15	1909-1913	Industrial Experience	Other or Not Specified Organs, by Sex and Single Years of Life	339
16	1909-1913	Industrial Experience	By Organs and Parts and Sex, at Divisional Periods of Life	341
17	1909-1913	Industrial Experience	At Divisional Periods of Life, by Organs and Parts, according to Sex	343
18	1891-1913	Ordinary Experience	Persons	344
19	1891-1913	Ordinary Experience	By Sex	345
20	1886-1913	Ordinary Experience	By Age and Sex	346

APPENDIX D

The Prudential Insurance Company of America (*concluded*)

Table	Period		Title	Page
21	1886-1913	Ordinary Experience	By Organs and Parts and Sex, Average Age at Death	346
22	1886-1913	Ordinary Experience	By Organs and Parts and Sex, at Divisional Periods of Life.	347
23	1886-1913	Ordinary Experience	At Divisional Periods of Life, by Organs and Parts, according to Sex	348
24	1886-1913	Ordinary Experience	By Organs and Parts at Single Years of Life, Males	350
25	1886-1913	Ordinary Experience	By Organs and Parts at Single Years of Life, Females	352
26	1886-1912	Ordinary Experience	By Weight and Age at Entry, Males	354
27	1886-1912	Ordinary Experience	Family History, Cancer and Tuberculosis Compared	355

Other American Companies

Table	Period	Company	Title	Page
28	1885-1908	American Companies	According to Build, Males	356
29	1885-1908	American Companies	By Duration of Policy and Age at Entry	356
30	Up to 1873	Twenty-seven American Companies	By Age and Sex	357
31	1870-1913	Ætna	Persons	358
32	1843-1914	Mutual Life of New York	By Age and Sex	359
33	1843-1914	Mutual Life of New York	By Age and Sex	359
34	1843-1898	Mutual Life of New York	Other Tumors, by Age and Sex	360
35	1901-1913	New York Life	Persons	360
36	1857-1909	Northwestern Mutual Life	By Age, Males	361
37	1860-1886	Washington Life	By Age	361

Foreign Companies

Table	Period	Company	Title	Page
38		Thirty-four Foreign Companies	Comparative Statement by Countries	361
39		Thirty-four Foreign Companies	By Individual Companies	362

English Companies

Table	Period	Company	Title	Page
40	1847-1872	British Empire Mutual Life	Cancer and Tumor, by Age	363
41	1873-1878	British Empire Mutual Life	Cancer and Tumor, by Age	364
42	1829-1887	Clergy Mutual	By Age	364
43	1829-1887	Clergy Mutual	By Age, Unhealthy Lives	365
44	1801-1832	Equitable Society	By Age	365
45	Up to 1866	Gresham Life	Cancer and Tumor, by Age	366
46	1835-1864	Metropolitan Life Assurance	Cancer and Tumor, by Age	366
47	1867-1870	Prudential Assurance	Cancer, by Age and Sex	367
48	1867-1870	Prudential Assurance	Tumor, by Age and Sex	367
49	1867-1870	Prudential Assurance	By Age and Organs and Parts, Males	368
50	1867-1870	Prudential Assurance	By Age and Organs and Parts, Females	369

APPENDIX D

Scotch Companies

Table	Period	Company	Title
51	1826-1860	Scottish Amicable Life	By Age
52	1826-1860	Scottish Amicable Life	Cancer, by Age and Sex, Non-hazardous Occupations
53	1826-1860	Scottish Amicable Life	Tumor, by Age and Sex, Non-hazardous Occupations
54	1826-1860	Scottish Amicable Life	By Age, Hazardous Occupations
55	1912	Scottish Union and National	By Organs and Parts
56	1815-1845	Scottish Widows' Fund	Cancer and Tumor, by Age
57	1846-1852	Scottish Widows' Fund	Cancer and Tumor, by Age
58	1853-1859	Scottish Widows' Fund	Cancer and Tumor, by Age
59	1874-1880 1888-1894	Scottish Widows' Fund	Comparative Statement, according to Age
60	1874-1880 1881-1887 1888-1894	Scottish Widows' Fund	Comparative Statement, according to Age
61	1874-1894	Scottish Widows' Fund	Internal and External Organs, Males
62	1874-1894	Scottish Widows' Fund	Internal and External Organs, Based upon Number of Lives Exposed to Risk, Males
63	Up to 1860	British and German Companies	Comparative Statement

German Companies

Table	Period	Company	Title
64	1899-1912	German Companies	Combined Experience
65	1908-1911	"Deutscher Kriegerbund"	By Organs
66	1907-1912	German Life Insurance Company, Potsdam	By Age
67	1907-1913	"Freia," Hanover	By Age
68	1885-1913	"Friedrich Wilhelm," Ordinary Experience	Persons
69	1885-1899	"Friedrich Wilhelm," Ordinary Experience	By Organs and Parts, according to Sex
70	1885-1899	"Friedrich Wilhelm," Ordinary Experience	By Age and Sex
71	1885-1899	"Friedrich Wilhelm," Industrial Experience	By sex
72	1885-1899	"Friedrich Wilhelm," Industrial Experience	By Organs and Parts and Sex
73	1885-1899	"Friedrich Wilhelm," Industrial Experience	By Age and Sex
74	1906-1913	German Life Insurance Company, Lübeck	By Sex
75	1857-1894	"Germania"	By Age and Sex, Based upon Number of Lives Exposed to Risk
76	1829-1878	Gotha Life Insurance	By Age, Males
77	1829-1896	Gotha Life Insurance	By Age and Duration of Insurance, Males
78	1903-1912	Gotha Life Insurance	By Age
79	1829-1890	Gotha Life Insurance	By Age, among Teachers

APPENDIX D

GERMAN COMPANIES (*concluded*)

Table	Period	Company	Title	Page
80	1910-1913	Karlsruhe Life Insurance	Persons	385
81	1910-1913	Karlsruhe Life Insurance	By Organs and Parts, according to Age	386
82	1900-1905	Karlsruhe Life Insurance	By Organs and Parts	386
83	1900-1905	Karlsruhe Life Insurance	By Age	387
84	1893-1913	Leipzig Life Insurance	By Sex	387
85	1893-1912	Leipzig Life Insurance	By Age, Males	388
86	1901-1913	Magdeburg Life Insurance	Persons	388
87	1901-1913	Magdeburg Life Insurance	By Age	388
88	1903-1906	Saxon Military Life Insurance	By Organs and Parts, according to Sex	389
89	1901-1906	Stuttgart Life Insurance	By Age	389
90	1905-1912	Teutonia Insurance	By Age	389
91	1903-1913	"Victoria," Berlin	Persons	390
		AUSTRIAN COMPANIES		
92	1899-1912	Austrian Companies	Persons	390
93	1899-1912	Austrian Companies	By Age	391
94	1876-1890 1891-1900	Austrian Companies	Comparative Statement, by Age	391
95	1876-1900	Austrian Companies	Probability of Death from Cancer, according to Age	392
96	1901-1913	"Der Anker," Vienna	By Age	392
97	1899-1912	"Assicurazioni Generali," Trieste	Persons	392
98	1899-1912	"Assicurazioni Generali," Trieste	By Age	393
99	1908-1912	"Donau," Vienna	By Age	393
100	1900-1912	First General Association of Austro-Hungarian Officials	By Age	393
101	1907-1912	"Janus," Vienna	By Age	393
102	1906-1912	Life Insurance Company of the "Margraviate Moravia," Brünn	By Age	394
103	1905-1912	Mutual Life Insurance Company, Krakau	By Age	394
104	1901-1913	"Phœnix," Vienna	Persons	394
105	1901-1912	"Phœnix," Vienna	By Age	395
106	1900-1907	"Praha," Prague	By Age	395
107	1899-1912	"Riunione Adriatica Sicurta"	By Age	395
108	1907-1912	"Universale," Vienna	By Age	396
		HUNGARIAN COMPANIES		
109	1900-1912	"Foncière," Budapest	By Age	396
		SWISS COMPANIES		
110	1865-1897	The Basle Life Insurance	Persons, by Sex	396
111	1901-1913	"La Suisse," Lausanne	By Age	396
		SWEDISH COMPANIES		
112	1873-1902	"Thule," Stockholm	Persons	397

22

APPENDIX D

Australian Companies

Table	Period	Company	Title	Page
113	1849-1888	Australian Mutual Provident....	Cancer, by Age and Sex......	398
114	1849-1888	Australian Mutual Provident....	Tumor, by Age and Sex.....	398

East Indian Companies

Table	Period	Company	Title	Page
115	1897-1913	The Oriental Government Security Life Assurance, Bombay...	By Race..................	399
116	1911-1913	The Dutch East Indian Life Insurance, Batavia............	By Age....................	399

Japanese Companies

Table	Period	Company	Title	Page
117	1899-1907	Meiji Life Assurance...........	By Sex....................	399
118	1899-1907	Meiji Life Assurance...........	By Age and Sex............	400
119	1899-1907	Meiji Life Assurance...........	By Organs and Parts, according to Sex................	400
120	1910-1912	Domestic Companies...........	By Organs and Parts, according to Age and Sex.........	401
121	1912	Foreign Companies	By Organs and Parts, according to Age, Males..........	401

APPENDIX D

Table 1

strial Mortality Experience of The Prudential Insurance Company of America—White

Mortality from Cancer

1891-1913

	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
....	17,420	515	3.0
....	20,439	614	3.0
....	22,190	750	3.4
....	26,527	832	3.1
....	29,720	943	3.2
1895..............................	116,296	3,654	3.1
....	30,450	1,087	3.6
....	29,564	1,180	4.0
....	31,396	1,214	3.9
....	35,992	1,413	3.9
....	42,433	1,616	3.8
1900..............................	169,835	6,510	3.8
....	46,076	1,877	4.1
....	47,870	1,986	4.1
....	51,896	2,304	4.4
....	58,211	2,530	4.3
....	57,665	2,766	4.8
1905..............................	261,718	11,463	4.4
....	62,210	3,110	5.0
....	66,174	3,375	5.1
....	64,277	3,414	5.3
....	67,390	3,684	5.5
....	76,916	4,144	5.4
1910..............................	336,967	17,727	5.3
....	78,216	4,324	5.5
....	80,165	4,770	6.0
....	86,806	5,285	6.1

APPENDIX D

Table 2

Industrial Mortality Experience of The Prudential Insurance Comp America—White

Mortality from Cancer, by Sex

1891-1913

Year	MALES Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.	FEMALES Deaths from All Causes	Deaths from Cancer
1891.................	8,916	173	1.9	8,504	342
1892.................	10,544	203	1.9	9,895	411
1893.................	11,612	237	2.0	10,578	513
1894.................	13,981	294	2.1	12,546	538
1895.................	15,473	319	2.1	14,247	624
1891–1895............	60,526	1,226	2.0	55,770	2,428
1896.................	15,565	394	2.5	14,885	693
1897.................	14,913	394	2.6	14,651	786
1898.................	15,868	423	2.7	15,528	791
1899.................	17,981	445	2.5	18,011	968
1900.................	21,267	566	2.7	21,166	1,050
1896–1900............	85,594	2,222	2.6	84,241	4,288
1901.................	23,065	609	2.6	23,011	1,268
1902.................	24,106	611	2.5	23,764	1,375
1903.................	26,277	757	2.9	25,619	1,547
1904.................	28,942	825	2.9	29,269	1,705
1905.................	28,380	910	3.2	29,285	1,856
1901–1905............	130,770	3,712	2.8	130,948	7,751
1906.................	31,242	992	3.2	30,968	2,118
1907.................	33,591	1,128	3.4	32,583	2,247
1908.................	31,803	1,127	3.5	32,474	2,287
1909.................	34,038	1,215	3.6	33,352	2,469
1910.................	38,499	1,310	3.4	38,417	2,834
1906–1910............	169,173	5,772	3.4	167,794	11,955
1911.................	38,881	1,414	3.6	39,335	2,910
1912.................	40,128	1,516	3.8	40,037	3,254
1913.................	43,587	1,757	4.0	43,219	3,528

APPENDIX D

Table 3

trial Mortality Experience of The Prudential Insurance Company of America—White

Mortality from Cancer and from All Causes, by Age and Sex

1909-1913

	MALES			FEMALES		
	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
	20,747	49	0.2	17,962	37	0.2
	9,922	49	0.5	8,376	25	0.3
	5,153	25	0.5	4,502	23	0.5
	7,659	44	0.6	7,004	48	0.7
	10,079	62	0.6	10,399	76	0.7
	10,523	75	0.7	10,964	191	1.7
	11,409	121	1.1	10,726	450	4.2
	12,338	206	1.7	10,855	798	7.4
	12,288	338	2.8	10,822	1,354	12.5
	12,629	578	4.6	11,367	1,731	15.2
	13,669	857	6.3	13,233	2,203	16.6
	14,678	1,103	7.5	14,709	2,166	14.7
	16,011	1,304	8.1	16,969	2,090	12.3
	15,177	1,141	7.5	17,165	1,779	10.4
	11,910	727	6.1	14,685	1,195	8.1
	7,443	409	5.5	9,552	607	6.4
over	3,498	124	3.5	5,070	222	4.4
tal	195,133	7,212	3.7	194,360	14,995	7.7

Table 4

trial Mortality Experience of The Prudential Insurance Company of America—White

lortality from Sarcoma and from Other Forms of Cancer, by Age

1909-1912

	SARCOMA		OTHER FORMS OF CANCER	
Ages	Number of Deaths	Per Cent.	Number of Deaths	Per Cent.
Under 5	29	4.7	36	0.2
5– 9	21	3.4	25	0.2
10–19	48	7.8	60	0.4
20–29	74	12.0	218	1.3
30–39	72	11.7	1,132	6.9
40–49	81	13.1	2,967	18.2
50–59	128	20.7	4,663	28.6
60–69	119	19.3	4,725	29.0
70–79	42	6.8	2,218	13.6
80 and over	3	0.5	255	1.6
Total	617	100.0	16,299	100.0
Under 40	244	39.6	1,471	9.0
40 and over	373	60.4	14,828	91.0

APPENDIX D

Table 5

Industrial Mortality Experience of The Prudential Insurance Company of America—White

Mortality from Sarcoma and from Other Forms of Cancer by Age and Sex

1909-1912

	MALES				FEMALES			
	Sarcoma		Other Forms of Cancer		Sarcoma		Other Forms of Cancer	
Ages	Number of Deaths	Per Cent.	Number of Deaths	Per Cent.	Number of Deaths	Per Cent.	Number of Deaths	Per Cent.
Under 5	18	6.1	17	0.3	11	3.4	19	0.2
5– 9	14	4.8	15	0.3	7	2.2	10	0.1
10–19	26	8.8	24	0.5	22	6.8	36	0.3
20–29	43	14.6	55	1.1	31	9.6	163	1.5
30–39	33	11.2	217	4.2	39	12.1	915	8.2
40–49	34	11.6	670	13.0	47	14.6	2,297	20.6
50–59	54	18.4	1,407	27.2	74	22.9	3,256	29.2
60–69	54	18.4	1,815	35.2	65	20.1	2,910	26.1
70–79	17	5.8	850	16.5	25	7.7	1,368	12.3
80 and over	1	0.3	91	1.7	2	0.6	164	1.5
Total	294	100.0	5,161	100.0	323	100.0	11,138	100.0
Under 40	134	45.5	328	6.4	110	34.1	1,143	10.3
40 and over	160	54.5	4,833	93.6	213	65.9	9,995	89.7

Table 6

Industrial Mortality Experience of The Prudential Insurance Company of America—White

Mortality from Cancer and Average Age at Death, by Organs and Parts, according to Sex

1909-1913

	MALES			FEMALES		
Organ or Part	Number of Deaths	Aggregate Years of Life	Average Age at Death	Number of Deaths	Aggregate Years of Life	Average Age at Death
Buccal cavity	603	35,768	59.3	157	9,377	59.7
Stomach and liver	3,628	213,200	58.8	5,022	293,488	58.4
Peritoneum, intestines and rectum	819	46,189	56.4	1,576	89,334	56.7
Female generative organs	..	..	..	4,180	215,397	51.5
Breast	36	2,026	56.3	1,737	94,966	54.7
Skin	346	21,715	62.8	261	16,475	63.1
Other organs	1,470	79,827	54.3	1,235	64,896	52.5
Organs not specified	310	17,590	56.7	827	44,494	53.8
All organs	7,212	416,315	57.7	14,995	828,427	55.2

APPENDIX D

Table 7

rial Mortality Experience of The Prudential Insurance Company of America—White

Mortality from Sarcoma and Average Age at Death, by Organs and Parts, according to Sex

1909-1912

Organ or Part	Number of Deaths	Aggregate Years of Life	Average Age at Death
MALES			
:avity........................	18	864	48.0
ı and liver....................	23	907	39.4
:um, intestines and rectum.....	20	791	39.6
....	1	42	42.0
....	10	451	45.1
rgans.........................	184	7,032	38.2
ıot specified..................	38	1,927	50.7
ns..........................	294	12,014	40.9
FEMALES			
:avity.......................	20	1,110	55.5
ı and liver..................	30	1,567	52.2
:um, intestines and rectum.....	24	1,171	48.8
generative organs............	23	963	41.9
....	6	331	55.2
....	12	567	47.3
rgans........................	155	6,834	44.1
not specified................	53	2,426	45.8
ns..........................	323	14,969	46.3

APPENDIX D

Table 8

Industrial Mortality Experience of The Prudential Insurance Company of America—White

Mortality from Cancer, by Single Years of Life, according to Sex

1909-1913

Age at Death	MALES Number of Deaths	MALES Aggregate Years of Life	FEMALES Number of Deaths	FEMALES Aggregate Years of Life
2	12	24	15	30
3	21	63	11	33
4	16	64	11	44
5	17	85	5	25
6	12	72	4	24
7	10	70	3	21
8	9	72	8	64
9	1	9	5	45
10	9	90	4	40
11	5	55	5	55
12	4	48	1	12
13	5	65	4	52
14	2	28	9	126
15	4	60	7	105
16	7	112	7	112
17	8	136	15	255
18	14	252	8	144
19	11	209	11	209
20	12	240	9	180
21	11	231	8	168
22	18	396	15	330
23	5	115	17	391
24	16	384	27	648
25	20	500	16	400
26	17	442	32	832
27	16	432	35	945
28	11	308	56	1,568
29	11	319	52	1,508
30	17	510	63	1,890
31	17	527	80	2,480
32	29	928	94	3,008
33	29	957	99	3,267
34	29	986	114	3,876
35	38	1,330	112	3,920
36	37	1,332	138	4,968
37	39	1,443	147	5,439
38	47	1,786	200	7,600
39	45	1,755	201	7,839
40	47	1,880	243	9,720
41	49	2,009	243	9,963
42	83	3,486	278	11,676
43	72	3,096	277	11,911
44	87	3,828	313	13,772
45	107	4,815	311	13,995
46	121	5,566	311	14,306
47	110	5,170	355	16,685
48	111	5,328	377	18,096
49	129	6,321	377	18,473

Table 8 (concluded)

rial Mortality Experience of The Prudential Insurance Company of America—White

Aortality from Cancer, by Single Years of Life, according to Sex

1909-1913

	MALES		FEMALES	
	Number of Deaths	Aggregate Years of Life	Number of Deaths	Aggregate Years of Life
....	164	8,200	428	21,400
....	167	8,517	459	23,409
....	193	10,036	449	23,348
....	164	8,692	443	23,479
....	169	9,126	424	22,896
....	207	11,385	423	23,265
....	206	11,536	457	25,592
....	219	12,483	414	23,598
....	225	13,050	410	23,780
....	246	14,514	462	27,258
....	235	14,100	423	25,380
....	268	16,348	404	24,644
....	251	15,562	421	26,102
....	284	17,892	406	25,578
....	266	17,024	436	27,904
....	269	17,485	382	24,830
....	245	16,170	393	25,938
....	209	14,003	356	23,852
....	207	14,076	313	21,284
....	211	14,559	335	23,115
....	205	14,350	298	20,860
....	154	10,934	263	18,673
....	124	8,928	240	17,280
....	142	10,366	205	14,965
....	102	7,548	189	13,986
....	125	9,375	168	12,600
....	88	6,688	131	9,956
....	85	6,545	118	9,086
....	64	4,992	106	8,268
....	47	3,713	84	6,636
....	34	2,720	62	4,960
....	34	2,754	46	3,726
....	16	1,312	38	3,116
....	14	1,162	28	2,324
....	9	756	18	1,512
....	5	425	16	1,360
....	5	430	6	516
....	3	261	6	522
....	1	88	..	..
....	..	..	1	89
....	1	90	1	90
....	..	..	..	..
....	..	..	..	..
....	2	186	..	..
tal.....................	7,212	416,315	14,995	828,427
e age..................		57.7		55.2

APPENDIX D

Table 9

Industrial Mortality Experience of The Prudential Insurance Company of America—White

Mortality from Cancer of the Buccal Cavity, by Single Years of Life according to Sex

1909-1913

	MALES		FEMALES	
Age at Death	Number of Deaths	Aggregate Years of Life	Number of Deaths	Aggregate Years of Life
2	1	2	..	..
3	..	..	..	..
4	1	4	2	8
5	..	..	..	..
6	2	12	..	..
7	..	..	..	..
8	..	..	..	..
9	..	..	..	..
10	1	10	..	..
11	..	..	1	11
12	1	12	..	..
13	..	..	..	..
14	..	..	..	..
15	1	15	..	..
16	1	16	..	..
17	..	..	1	17
18	2	36	..	..
19	1	19	..	..
20	1	20	..	..
21	1	21	1	21
22	..	..	1	22
23	..	..	1	23
24	1	24	..	..
25	..	..	..	..
26	..	..	..	..
27	..	..	..	..
28	..	..	..	..
29	..	..	1	29
30	..	..	..	..
31	1	31	2	62
32	1	32	1	32
33	..	..	..	..
34	1	34	1	34
35	3	105	1	35
36	3	108	1	36
37	..	..	..	..
38	1	38	..	..
39	4	156	1	39
40	2	80	1	40
41	6	246	2	82
42	6	252	3	126
43	7	301	1	43
44	7	308	1	44
45	5	225	1	45
46	9	414	1	46
47	7	329	1	47
48	16	768	2	96

Table 9 (concluded)

·ial Mortality Experience of The Prudential Insurance Company of America—White

›rtality from Cancer of the Buccal Cavity, by Single Years of Life according to Sex

1909-1913

	MALES		FEMALES	
	Number of Deaths	Aggregate Years of Life	Number of Deaths	Aggregate Years of Life
....	17	833	2	98
....	18	900	4	200
....	13	663	2	102
....	15	780	3	156
....	13	689	6	318
....	16	864	2	108
....	18	990	2	110
....	19	1,064	6	336
....	22	1,254	4	228
....	18	1,044	7	406
....	27	1,593	3	177
....	18	1,080	1	60
....	18	1,098	3	183
....	16	992	5	310
....	25	1,575	3	189
....	21	1,344	5	320
....	22	1,430	5	325
....	17	1,122	10	660
....	19	1,273	5	335
....	20	1,360	1	68
....	19	1,311	4	276
....	16	1,120	5	350
....	11	781	3	213
....	11	792	3	216
....	16	1,168	3	219
....	12	888	6	444
....	13	975	6	450
....	10	760	5	380
....	5	385	1	77
....	5	390	5	390
....	3	237	2	158
....	2	160	1	80
....	6	486	2	162
....	5	410	..	..
....	1	83	2	166
....	..	..	1	84
....	2	170	1	85
....	1	86	..	..
ıl.....................	603	35,768	157	9,377
age..................		59.3		59.7

APPENDIX D

Table 10

Industrial Mortality Experience of The Prudential Insurance Company of America—White

Mortality from Cancer of the Stomach and Liver, by Single Years of Life according to Sex

1909-1913

Age at Death	MALES Number of Deaths	MALES Aggregate Years of Life	FEMALES Number of Deaths	FEMALES Aggregate Years of Life
2	2	4	3	6
3	3	9	1	3
4	3	12	..	..
5	3	15	1	5
6	2	12	1	6
7	4	28	1	7
8	2	16	1	8
9	..	..	2	18
10	1	10	..	..
11	1	11	1	11
12	..	..	..	..
13	..	..	..	..
14	..	..	1	14
15	..	..	1	15
16	1	16	1	16
17	..	..	1	17
18	2	36	..	..
19	..	..	2	38
20	1	20	4	80
21	3	63	..	..
22	2	44	1	22
23	1	23	3	69
24	8	192	4	96
25	4	100	2	50
26	4	104	5	130
27	4	108	7	189
28	5	140	7	196
29	2	58	7	203
30	3	90	7	210
31	8	248	17	527
32	7	224	15	480
33	11	363	21	693
34	15	510	21	714
35	15	525	22	770
36	18	648	20	720
37	19	703	21	777
38	24	912	43	1,634
39	23	897	43	1,677
40	21	840	56	2,240
41	25	1,025	47	1,927
42	42	1,764	67	2,814
43	35	1,505	55	2,365
44	51	2,244	63	2,772
45	55	2,475	78	3,510
46	62	2,852	75	3,450
47	57	2,679	97	4,559
48	57	2,736	108	5,184

Table 10 (concluded)

Industrial Mortality Experience of The Prudential Insurance Company of America—White

Mortality from Cancer of the Stomach and Liver, by Single Years of Life according to Sex

1909-1913

Age at Death	MALES Number of Deaths	MALES Aggregate Years of Life	FEMALES Number of Deaths	FEMALES Aggregate Years of Life
49	56	2,744	110	5,390
50	79	3,950	109	5,450
51	94	4,794	136	6,936
52	115	5,980	158	8,216
53	89	4,717	127	6,731
54	88	4,752	148	7,992
55	113	6,215	145	7,975
56	111	6,216	165	9,240
57	111	6,327	166	9,462
58	118	6,844	156	9,048
59	146	8,614	201	11,859
60	120	7,200	176	10,560
61	165	10,065	177	10,797
62	151	9,362	183	11,346
63	153	9,639	158	9,954
64	145	9,280	188	12,032
65	144	9,360	164	10,660
66	132	8,712	171	11,286
67	107	7,169	136	9,112
68	101	6,868	130	8,840
69	100	6,900	134	9,246
70	99	6,930	119	8,330
71	78	5,538	111	7,881
72	65	4,680	109	7,848
73	52	3,796	99	7,227
74	51	3,774	82	6,068
75	60	4,500	79	5,925
76	37	2,812	52	3,952
77	43	3,311	46	3,542
78	33	2,574	29	2,262
79	26	2,054	41	3,239
80	17	1,360	36	2,880
81	7	567	14	1,134
82	5	410	11	902
83	3	249	8	664
84	6	504	6	504
85	..	..	4	340
86	2	172	1	86
87	..	..	3	261
88	..	..	..	..
89	..	..	1	89
Total	3,628	213,200	5,022	293,488
Average age		58.8		58.4

APPENDIX D

Table 11

Industrial Mortality Experience of The Prudential Insurance Company of America—White

Mortality from Cancer of the Peritoneum, Intestines and Rectum by Single Years of Life, according to Sex

1909-1913

Age at Death	MALES Number of Deaths	MALES Aggregate Years of Life	FEMALES Number of Deaths	FEMALES Aggregate Years of Life
2	..	..	..	..
3	3	9	..	..
4	1	4	..	..
5	4	20	..	..
6	1	6	1	6
7	1	7	..	..
8	2	16	2	16
9	..	..	1	9
10	..	..	..	..
11	..	..	..	..
12	1	12	..	..
13	..	..	..	..
14	..	..	2	28
15	..	..	1	15
16	..	..	..	..
17	1	17	..	..
18	..	..	..	..
19	2	38	1	19
20	2	40	..	..
21	1	21	1	21
22	3	66	3	66
23	..	..	..	..
24	..	..	6	144
25	3	75	3	75
26	5	130	4	104
27	4	108	3	81
28	3	84	6	168
29	2	58	6	174
30	8	240	8	240
31	5	155	4	124
32	8	256	12	384
33	5	165	11	363
34	3	102	14	476
35	6	210	11	385
36	5	180	10	360
37	8	296	14	518
38	4	152	13	494
39	3	117	19	741
40	8	320	23	920
41	7	287	25	1,025
42	11	462	19	798
43	9	387	19	817
44	3	132	34	1,496
45	9	405	22	990
46	19	874	33	1,518
47	17	799	30	1,410
48	8	384	34	1,632
49	20	980	42	2,058
50	23	1,150	34	1,700

Table 11 (concluded)

ortality Experience of The Prudential Insurance Company of America—White

ity from Cancer of the Peritoneum, Intestines and Rectum by Single Years of Life, according to Sex

1909-1913

	MALES		FEMALES	
	Number of Deaths	Aggregate Years of Life	Number of Deaths	Aggregate Years of Life
....	18	918	41	2,091
....	20	1,040	39	2,028
....	24	1,272	58	3,074
....	21	1,134	43	2,322
....	23	1,265	47	2,585
....	25	1,400	47	2,632
....	23	1,311	29	1,653
....	29	1,682	41	2,378
....	18	1,062	46	2,714
....	27	1,620	45	2,700
....	18	1,098	43	2,623
....	26	1,612	47	2,914
....	32	2,016	54	3,402
....	36	2,304	56	3,584
....	24	1,560	46	2,990
....	30	1,980	53	3,498
....	14	938	45	3,015
....	21	1,428	25	1,700
....	28	1,932	44	3,036
....	29	2,030	39	2,730
....	18	1,278	42	2,982
....	18	1,296	30	2,160
....	16	1,168	20	1,460
....	9	666	23	1,702
....	11	825	21	1,575
....	10	760	17	1,292
....	8	616	10	770
....	5	390	17	1,326
....	3	237	9	711
....	1	80	5	400
....	2	162	5	405
....	..	..	6	492
....	2	166	4	332
....	..	..	3	252
....	..	..	3	255
....	1	86	1	86
....	..	..	..	..
....	..	..	..	..
....	..	..	..	..
....	..	..	1	90
....	..	..	..	..
....	..	..	..	..
....	1	93	..	..
....	..	..	..	..
....	..	..	..	..
....	819	46,189	1,576	89,334
....		56.4		56.7

APPENDIX D

Table 12

Industrial Mortality Experience of The Prudential Insurance Company of America—White

Mortality from Cancer of the Female Generative Organs by Single Years of Life

1909-1913

Age at Death	Number of Deaths	Aggregate Years of Life	Age at Death	Number of Deaths	Aggregate Years of Life
2	2	4	47	121	5,687
3	..	..	48	125	6,000
4	..	..	49	122	5,978
5	..	..	50	174	8,700
6	..	..	51	156	7,956
7	..	..	52	141	7,332
8	1	8	53	136	7,208
9	..	..	54	140	7,560
10	1	10	55	127	6,985
11	..	..	56	126	7,056
12	..	..	57	115	6,555
13	1	13	58	104	6,032
14	..	..	59	111	6,549
15	2	30	60	95	5,700
16	1	16	61	81	4,941
17	3	51	62	96	5,952
18	2	36	63	93	5,859
19	1	19	64	81	5,184
20	1	20	65	75	4,875
21	2	42	66	58	3,828
22	3	66	67	75	5,025
23	5	115	68	67	4,556
24	9	216	69	69	4,761
25	5	125	70	51	3,570
26	16	416	71	39	2,769
27	15	405	72	34	2,448
28	24	672	73	25	1,825
29	18	522	74	25	1,850
30	26	780	75	16	1,200
31	34	1,054	76	20	1,520
32	47	1,504	77	17	1,309
33	40	1,320	78	16	1,248
34	46	1,564	79	5	395
35	51	1,785	80	1	80
36	65	2,340	81	6	486
37	74	2,738	82	6	492
38	81	3,078	83	6	498
39	68	2,652	84	..	..
40	90	3,600	85	..	..
41	93	3,813	86	1	86
42	115	4,830	87	1	87
43	113	4,859			
44	125	5,500	Total	4,180	215,397
45	126	5,670			
46	117	5,382	Average age		51.5

APPENDIX D

Table 13

trial Mortality Experience of The Prudential Insurance Company of America—White

Mortality from Cancer of the Breast, by Single Years of Life according to Sex

1909-1913

	MALES		FEMALES	
	Number of Deaths	Aggregate Years of Life	Number of Deaths	Aggregate Years of Life
	..	..	1	2
	..	..	..	..
	..	..	..	..
	..	..	..	..
	..	..	..	..
	..	..	..	..
	..	..	..	..
	..	..	..	..
	..	..	..	..
	..	..	..	..
	..	..	..	..
	..	..	..	..
	..	..	..	..
	..	..	..	..
	..	..	..	..
	..	..	..	..
	..	..	..	..
	..	..	..	..
	..	..	..	..
	..	..	..	..
	..	..	2	44
	..	..	..	..
	1	24	1	24
	..	..	2	50
	..	..	..	..
	..	..	3	81
	..	..	3	84
	..	..	4	116
	..	..	11	330
	..	..	9	279
	..	..	8	256
	..	..	13	429
	..	..	10	340
	..	..	12	420
	..	..	23	828
	1	37	17	629
	..	..	34	1,292
	1	39	34	1,326
	..	..	32	1,280
	..	..	44	1,804
	1	42	31	1,302
	1	43	48	2,064
	1	44	42	1,848
	4	180	41	1,845
	..	..	34	1,564
	1	47	52	2,444
	..	..	51	2,448

APPENDIX D

Table 13 (concluded)

Industrial Mortality Experience of The Prudential Insurance Company of America—White

Mortality from Cancer of the Breast, by Single Years of Life according to Sex

1909-1913

Age at Death	MALES Number of Deaths	MALES Aggregate Years of Life	FEMALES Number of Deaths	FEMALES Aggregate Years of Life
49	..	..	51	2,499
50	1	50	50	2,500
51	1	51	67	3,417
52	1	52	57	2,964
53	..	..	56	2,968
54	..	..	45	2,430
55	3	165	43	2,365
56	1	56	54	3,024
57	1	57	45	2,565
58	2	116	46	2,668
59	..	..	41	2,419
60	1	60	42	2,520
61	..	..	53	3,233
62	1	62	42	2,604
63	..	..	36	2,268
64	1	64	41	2,624
65	2	130	39	2,535
66	..	..	40	2,640
67	3	201	38	2,546
68	..	..	36	2,448
69	3	207	30	2,070
70	2	140	36	2,520
71	..	..	31	2,201
72	..	..	26	1,872
73	1	73	23	1,679
74	..	..	23	1,702
75	..	..	17	1,275
76	..	..	16	1,216
77	..	..	9	693
78	..	..	5	390
79	..	..	14	1,106
80	..	..	8	640
81	..	..	5	405
82	..	..	4	328
83	..	..	3	249
84	..	..	2	168
85	..	..	..	..
86	1	86	1	86
Total	36	2,026	1,737	94,966
Average Age		56.3		54.7

Table 14

ial Mortality Experience of The Prudential Insurance Company of America—White

Mortality from Cancer of the Skin, by Single Years of Life according to Sex

1909-1913

	MALES		FEMALES	
	Number of Deaths	Aggregate Years of Life	Number of Deaths	Aggregate Years of Life
	..	..	..	..
	1	3	1	3
	1	4	..	..
	..	..	2	10
	..	..	..	..
	..	..	..	..
	..	..	..	..
	..	..	..	..
	..	..	..	..
	..	..	..	..
	..	..	1	12
	..	..	1	13
	..	..	1	14
	..	..	..	..
	..	..	..	..
	..	..	..	..
	..	..	..	..
	..	..	..	..
	..	..	..	..
	..	..	1	21
	..	..	..	..
	..	..	..	..
	..	..	..	..
	1	25	..	..
	..	..	1	26
	..	..	..	..
	..	..	2	56
	1	29	1	29
	..	..	..	..
	..	..	..	..
	2	64	1	32
	2	66	..	..
	..	..	1	34
	..	..	..	..
	1	36	1	36
	..	..	1	37
	1	38	..	..
	2	78	..	..
	2	80	2	80
	1	41	3	123
	5	210	2	84
	2	86	4	172
	2	88	1	44
	5	225	5	225
	7	322	..	..
	3	141	3	141
	4	192	3	144

APPENDIX D

Table 14 (concluded)

Industrial Mortality Experience of The Prudential Insurance Company of America—White

Mortality from Cancer of the Skin, by Single Years of Life according to Sex

1909-1913

Age at Death	MALES Number of Deaths	Aggregate Years of Life	FEMALES Number of Deaths	Aggregate Years of Life
49	6	294	5	245
50	3	150	3	150
51	4	204	4	204
52	5	260	2	104
53	5	265	4	212
54	10	540	1	54
55	7	385	7	385
56	6	336	6	336
57	11	627	5	285
58	5	290	4	232
59	11	649	3	177
60	14	840	5	300
61	16	976	8	488
62	11	682	10	620
63	11	693	8	504
64	9	576	10	640
65	14	910	3	195
66	16	1,056	8	528
67	11	737	6	402
68	11	748	12	816
69	11	759	8	552
70	10	700	11	770
71	8	568	6	426
72	11	792	10	720
73	12	876	7	511
74	9	666	8	592
75	9	675	5	375
76	10	760	5	380
77	6	462	10	770
78	2	156	6	468
79	6	474	8	632
80	8	640	4	320
81	8	648	6	486
82	2	164	4	328
83	1	83	1	83
84	..	..	3	252
85	1	85	6	510
86	..	..	..	..
87	3	261	1	87
Total	346	21,715	261	16,475
Average Age		62.8		63.1

APPENDIX D

Table 15

ial Mortality Experience of The Prudential Insurance Company of America—White

Mortality from Cancer of Other or Not Specified Organs by Single Years of Life, according to Sex

1909-1913

	MALES Number of Deaths	MALES Aggregate Years of Life	FEMALES Number of Deaths	FEMALES Aggregate Years of Life
....	9	18	9	18
....	14	42	9	27
....	10	40	9	36
....	10	50	2	10
....	7	42	2	12
....	5	35	2	14
....	5	40	4	32
....	1	9	2	18
....	7	70	3	30
....	4	44	3	33
....	2	24	..	..
....	5	65	2	26
....	2	28	5	70
....	3	45	3	45
....	5	80	5	80
....	7	119	10	170
....	10	180	6	108
....	8	152	7	133
....	8	160	4	80
....	6	126	3	63
....	13	286	5	110
....	4	92	8	184
....	6	144	7	168
....	12	300	4	100
....	8	208	6	156
....	8	216	7	189
....	3	84	14	392
....	6	174	15	435
....	6	180	11	330
....	3	93	14	434
....	11	352	10	320
....	11	363	14	462
....	10	340	21	714
....	14	490	15	525
....	10	360	18	648
....	11	407	20	740
....	17	646	29	1,102
....	12	468	36	1,404
....	14	560	39	1,560
....	10	410	29	1,189
....	18	756	41	1,722
....	18	774	37	1,591
....	23	1,012	47	2,068
....	29	1,305	38	1,710
....	24	1,104	51	2,346
....	25	1,175	51	2,397
....	26	1,248	54	2,592
....	30	1,470	45	2,205

APPENDIX D

Table 15 (concluded)

Industrial Mortality Experience of The Prudential Insurance Company of America—White

Mortality from Cancer of Other or Not Specified Organs by Single Years of Life, according to Sex

1909-1913

Age at Death	MALES Number of Deaths	MALES Aggregate Years of Life	FEMALES Number of Deaths	FEMALES Aggregate Years of Life
50	40	2,000	54	2,700
51	37	1,887	53	2,703
52	37	1,924	49	2,548
53	33	1,749	56	2,968
54	34	1,836	45	2,430
55	43	2,365	52	2,860
56	44	2,464	53	2,968
57	51	2,907	50	2,850
58	53	3,074	52	3,016
59	44	2,596	57	3,363
60	55	3,300	59	3,540
61	51	3,111	39	2,379
62	46	2,852	38	2,356
63	63	3,969	54	3,402
64	54	3,456	55	3,520
65	63	4,095	50	3,250
66	50	3,300	53	3,498
67	55	3,685	51	3,417
68	54	3,672	42	2,856
69	50	3,450	46	3,174
70	49	3,430	37	2,590
71	39	2,769	31	2,201
72	19	1,368	28	2,016
73	45	3,285	28	2,044
74	21	1,554	22	1,628
75	32	2,400	24	1,800
76	21	1,596	16	1,216
77	23	1,771	25	1,925
78	19	1,482	28	2,184
79	9	711	5	395
80	6	480	7	560
81	11	891	8	648
82	4	328	7	574
83	7	581	4	332
84	3	252	3	252
85	2	170	2	170
86	..	..	2	172
87	..	..	1	87
88	1	88	..	..
89	..	..	..	..
90	1	90	..	..
91	..	..	..	..
92	..	..	..	..
93	1	93	..	..
Total	1,780	97,417	2,062	109,390
Average age		54.7		53.1

APPENDIX D

Table 16

ial Mortality Experience of The Prudential Insurance Company of America—White

ortality from Cancer, by Organs and Parts, according to Sex at Divisional Periods of Life

1909-1913

Organ or Part	MALES No. of Deaths	MALES Per Cent.	FEMALES No of Deaths	FEMALES Per Cent.
AGES UNDER 35				
avity	17	4.0	12	1.4
and liver	102	24.0	138	16.2
um, intestines, rectum	68	16.0	89	10.5
enerative organs	..	..	305	35.9
	1	0.2	67	7.9
	8	1.9	13	1.5
not specified organs	229	53.9	226	26.6
s	425	100.0	850	100.0
AGES 35-44				
avity	39	7.2	11	0.5
and liver	273	50.2	437	20.3
um, intestines, rectum	64	11.8	187	8.7
enerative organs	..	..	875	40.7
	5	0.9	317	14.7
	16	2.9	14	0.6
not specified organs	147	27.0	311	14.5
s	544	100.0	2,152	100.0
AGES 45-64				
avity	331	8.6	63	0.8
and liver	2,085	54.3	2,861	34.9
m, intestines, rectum	436	11.3	831	10.1
enerative organs	..	..	2,387	29.1
	18	0.5	947	11.6
	153	4.0	96	1.2
not specified organs	819	21.3	1,005	12.3
s	3,842	100.0	8,190	100.0

Table 16 (concluded)

Industrial Mortality Experience of The Prudential Insurance Company of America—White

Mortality from Cancer, by Organs and Parts, according to Sex at Divisional Periods of Life

1909-1913

Organ or Part	Males No. of Deaths	Males Per Cent.	Females No. of Deaths	Females Per Cent.
	AGES 65 AND OVER			
Buccal cavity	216	9.0	71	1.9
Stomach and liver	1,168	48.6	1,586	41.7
Peritoneum, intestines, rectum	251	10.5	469	12.3
Female generative organs	..	..	613	16.1
Breast	12	0.5	406	10.7
Skin	169	7.0	138	3.6
Other or not specified organs	585	24.4	520	13.7
All organs	2,401	100.0	3,803	100.0
	ALL AGES			
Buccal cavity	603	8.4	157	1.0
Stomach and liver	3,628	50.3	5,022	33.5
Peritoneum, intestines, rectum	819	11.3	1,576	10.5
Female generative organs	..	..	4,180	27.9
Breast	36	0.5	1,737	11.6
Skin	346	4.8	261	1.7
Other or not specified organs	1,780	24.7	2,062	13.8
All organs	7,212	100.0	14,995	100.0

APPENDIX D

Table 17

al Mortality Experience of The Prudential Insurance Company of America—White

y from Cancer at Divisional Periods of Life, by Organs and Parts according to Sex

1909-1913

	MALES No. of Deaths	MALES Per Cent.	FEMALES No. of Deaths	FEMALES Per Cent.
BUCCAL CAVITY				
....	17	2.8	12	7.7
....	39	6.5	11	7.0
....	331	54.9	63	40.1
er..................	216	35.8	71	45.2
....	603	100.0	157	100.0
STOMACH AND LIVER				
....	102	2.8	138	2.7
....	273	7.5	437	8.7
....	2,085	57.5	2,861	57.0
er..................	1,168	32.2	1,586	31.6
....	3,628	100.0	5,022	100.0
PERITONEUM, INTESTINES AND RECTUM				
....	68	8.3	89	5.6
....	64	7.8	187	11.9
....	436	53.2	831	52.7
er..................	251	30.7	469	29.8
....	819	100.0	1,576	100.0
FEMALE GENERATIVE ORGANS				
....	..	..	305	7.3
....	..	..	875	20.9
....	..	..	2,387	57.1
er..................	..	..	613	14.7
....	..	..	4,180	100.0
BREAST				
....	1	2.8	67	3.9
....	5	13.9	317	18.2
....	18	50.0	947	54.5
er..................	12	33.3	406	23.4
....	36	100.0	1,737	100.0
SKIN				
....	8	2.3	13	5.0
....	16	4.6	14	5.3
....	153	44.2	96	36.8
er..................	169	48.9	138	52.9
....	346	100.0	261	100.0

Table 17 (concluded)

Industrial Mortality Experience of The Prudential Insurance Company of America—White

Mortality from Cancer at Divisional Periods of Life, by Organs and Parts according to Sex

1909-1913

Ages	Males No. of Deaths	Males Per Cent.	Females No. of Deaths	Females Per Cent.
OTHER OR NOT SPECIFIED ORGANS				
Under 35	229	12.9	226	11.0
35–44	147	8.2	311	15.1
45–64	819	46.0	1,005	48.7
65 and over	585	32.9	520	25.2
Total	1,780	100.0	2,062	100.0
ALL ORGANS AND PARTS				
Under 35	425	5.9	850	5.7
35–44	544	7.5	2,152	14.3
45–64	3,842	53.3	8,190	54.6
65 and over	2,401	33.3	3,803	25.4
Total	7,212	100.0	14,995	100.0

Table 18

Ordinary Mortality Experience of The Prudential Insurance Company of America

Mortality from Cancer

1891-1913

Year	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.	Year	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
1891	33	..	..	1901	960	38	4.0
1892	46	3	6.5	1902	1,234	61	4.9
1893	73	3	4.1	1903	1,629	84	5.2
1894	76	2	2.6	1904	2,152	85	3.9
1895	149	5	3.4	1905	2,181	107	4.9
1891–1895	377	13	3.4	1901–1905	8,156	375	4.6
1896	188	7	3.7	1906	2,584	142	5.5
1897	247	14	5.7	1907	2,943	168	5.7
1898	406	13	3.2	1908	3,231	206	6.4
1899	520	12	2.3	1909	3,466	232	6.7
1900	663	21	3.2	1910	3,946	252	6.4
1896–1900	2,024	67	3.3	1906–1910	16,170	1,000	6.2
				1911	4,413	263	6.0
				1912	4,696	324	6.9
				1913	5,058	387	7.7

APPENDIX D

Table 19

ry Mortality Experience of The Prudential Insurance Company of America—White

Mortality from Cancer, by Sex

1891-1913

	MALES			FEMALES		
	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
....	28	..	..	5	..	..
....	39	1	2.6	7	2	28.6
....	64	3	4.7	9	..	..
....	69	2	2.9	7	..	..
....	138	3	2.2	11	2	18.2
)5............	338	9	2.7	39	4	10.3
....	172	6	3.5	16	1	6.3
....	225	11	4.9	22	3	13.6
....	366	10	2.7	40	3	7.5
....	450	9	2.0	70	3	4.3
....	558	16	2.9	105	5	4.8
)0............	1,771	52	2.9	253	15	5.9
....	810	29	3.6	150	9	6.0
....	1,027	45	4.4	207	16	7.7
....	1,361	62	4.6	268	22	8.2
....	1,752	54	3.1	400	31	7.8
....	1,737	64	3.7	444	43	9.7
)5............	6,687	254	3.8	1,469	121	8.2
....	2,080	92	4.4	504	50	9.9
....	2,414	115	4.8	529	53	10.0
....	2,600	134	5.2	631	72	11.4
....	2,826	166	5.9	640	66	10.3
....	3,206	181	5.6	740	71	9.6
l0............	13,126	688	5.2	3,044	312	10.2
....	3,542	182	5.1	871	81	9.3
....	3,800	216	5.7	896	108	12.1
....	4,115	263	6.4	943	124	13.1

Table 20

Ordinary Mortality Experience of The Prudential Insurance Company of America

Mortality from Cancer, by Age and Sex

1886-1913

	MALES			FEMALES		
Ages	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
Under 20	387	2	0.5	109	..	..
20–24	2,262	20	0.9	699	5	0.7
25–29	3,525	39	1.1	1,082	12	1.1
30–34	4,256	81	1.9	1,155	51	4.4
35–39	4,647	147	3.2	1,015	93	9.2
40–44	4,437	190	4.3	852	139	16.3
45–49	3,889	281	7.2	723	155	21.4
50–54	3,515	296	8.4	636	121	19.0
55–59	2,779	249	9.0	551	101	18.3
60–64	2,070	200	9.7	409	55	13.4
65–69	1,185	120	10.1	213	24	11.3
70–74	389	31	8.0	68	8	11.8
75 and over	78	7	9.0	7	..	..
Total	33,419	1,663	5.0	7,519	764	10.2

Table 21

Ordinary Mortality Experience of The Prudential Insurance Company of America

Mortality from Cancer, by Sex, Organs and Parts, and Average Age at Death

1886-1913

	MALES			FEMALES		
Organ or Part	Number of Deaths	Aggregate Years of Life	Average Age at Death	Number of Deaths	Aggregate Years of Life	Average Age at Death
Buccal cavity	89	4,493	50.5	..	..	..
Stomach and liver	860	44,280	51.5	179	9,064	50.6
Peritoneum, intestines and rectum	274	13,343	48.7	95	4,586	48.3
Female generative organs	..	..	..	264	12,214	46.3
Breast	3	161	53.7	118	5,479	46.4
Skin	32	1,607	50.2	5	259	51.8
Other organs	354	17,049	48.2	70	3,180	45.4
Organs not specified	51	2,490	48.8	33	1,512	45.8
All organs	1,663	83,423	50.2	764	36,294	47.5

APPENDIX D

Table 22

ry Mortality Experience of The Prudential Insurance Company of America

lty from Cancer, by Organs and Parts, according to Sex at Divisional Periods of Life

1886-1913

	MALES		FEMALES	
	AGES UNDER 35			
Organ or Part	No. of Deaths	Per Cent.	No. of Deaths	Per Cent.
avity..................	4	2.8	..	..
and liver..............	43	30.3	11	16.2
um, intestines, rectum...	32	22.5	10	14.7
enerative organs........	..	..	24	35.3
....	..	..	9	13.2
....	2	1.4	1	1.5
not specified organs.....	61	43.0	13	19.1
ls.....................	142	100.0	68	100.0
	AGES 35-44			
avity..................	23	6.8	..	..
and liver..............	162	48.1	38	16.4
um, intestines, rectum...	62	18.4	27	11.6
enerative organs........	..	..	89	38.4
....	..	..	42	18.1
....	7	2.1	..	..
not specified organs.....	83	24.6	36	15.5
s.....................	337	100.0	232	100.0
	AGES 45-64			
vity..................	57	5.6	..	..
and liver..............	571	55.7	115	26.6
m, intestines, rectum...	155	15.1	53	12.3
enerative organs........	..	..	148	34.3
....	3	0.3	62	14.3
....	22	2.1	3	0.7
not specified organs.....	218	21.2	51	11.8
s.....................	1,026	100.0	432	100.0

Table 22 (concluded)

Ordinary Mortality Experience of The Prudential Insurance Company of America

Mortality from Cancer, by Organs and Parts, according to Sex at Divisional Periods of Life

1886-1913

Organ or Part	MALES No. of Deaths	MALES Per Cent.	FEMALES No. of Deaths	FEMALES Per Cent.
	AGES 65 AND OVER			
Buccal cavity	5	3.2	..	..
Stomach and liver	84	53.2	15	46.9
Peritoneum, intestines, rectum	25	15.8	5	15.6
Female generative organs	..	..	3	9.4
Breast	..	..	5	15.6
Skin	1	0.6	1	3.1
Other or not specified organs	43	27.0	3	9.4
All organs	158	100.0	32	100.0
	ALL AGES			
Buccal cavity	89	5.3	..	..
Stomach and liver	860	51.7	179	23.4
Peritoneum, intestines, rectum	274	16.5	95	12.4
Female generative organs	..	..	264	34.6
Breast	3	0.2	118	15.4
Skin	32	1.9	5	0.7
Other or not specified organs	405	24.4	103	13.5
All organs	1,663	100.0	764	100.0

Table 23

Ordinary Mortality Experience of The Prudential Insurance Company of America

Mortality from Cancer at Divisional Periods of Life, by Organs and Parts according to Sex

1886-1913

Ages	MALES No. of Deaths	MALES Per Cent.	FEMALES No. of Deaths	FEMALES Per Cent.
	BUCCAL CAVITY			
Under 35	4	4.5	..	..
35–44	23	25.8	..	..
45–64	57	64.1	..	..
65 and over	5	5.6	..	..
Total	89	100.0	..	..
	STOMACH AND LIVER			
Under 35	43	5.0	11	6.1
35–44	162	18.8	38	21.2
45–64	571	66.4	115	64.3
65 and over	84	9.8	15	8.4
Total	860	100.0	179	100.0

APPENDIX D

Table 23 (concluded)

Mortality Experience of The Prudential Insurance Company of America

y from Cancer at Divisional Periods of Life, by Organs and Parts according to Sex

1886-1913

	MALES		FEMALES	
	No. of Deaths	Per Cent.	No. of Deaths	Per Cent.
PERITONEUM, INTESTINES AND RECTUM				
....	32	11.7	10	10.5
....	62	22.6	27	28.4
....	155	56.6	53	55.8
r....................	25	9.1	5	5.3
....	274	100.0	95	100.0
FEMALE GENERATIVE ORGANS				
....	..	..	24	9.1
....	..	..	89	33.7
....	..	..	148	56.1
r....................	..	..	3	1.1
....	..	..	264	100.0
BREAST				
....	..	..	9	7.6
....	..	..	42	35.6
....	3	100.0	62	52.6
r....................	..	..	5	4.2
....	3	100.0	118	100.0
SKIN				
....	2	6.3	1	20.0
....	7	21.9	..	..
....	22	68.7	3	60.0
r....................	1	3.1	1	20.0
....	32	100.0	5	100.0
OTHER OR NOT SPECIFIED ORGANS				
....	61	15.1	13	12.6
....	83	20.5	36	35.0
....	218	53.8	51	49.5
r....................	43	10.6	3	2.9
....	405	100.0	103	100.0
ALL ORGANS AND PARTS				
....	142	8.5	68	8.9
....	337	20.3	232	30.4
....	1,026	61.7	432	56.5
r....................	158	9.5	32	4.2
....	1,663	100.0	764	100.0

APPENDIX D

Table 24

Ordinary Mortality Experience of The Prudential Insurance Company of America

Mortality from Cancer, by Organs and Parts at Single Years of Life, Males 1886-1913

Age	Buccal Cavity	Stomach and Liver	Peritoneum Intestines Rectum	Breast	Skin	Other Organs	Organs not Specified	Total
19	..	..	1	..	..	..	1	2
20	..	..	..	..	..	4	..	4
21	..	..	1	..	..	4	..	5
22	..	..	3	..	..	..	1	4
23	..	..	..	..	..	4	..	4
24	..	..	1	..	..	2	..	3
25	..	3	..	..	1	1	..	5
26	..	3	2	..	..	2	..	7
27	..	1	4	..	..	3	1	9
28	1	2	1	..	..	2	1	7
29	1	2	3	..	1	3	1	11
30	..	4	4	..	..	6	..	14
31	2	5	4	..	..	4	1	16
32	..	9	1	..	..	5	1	16
33	..	5	5	..	..	7	1	18
34	..	9	2	..	..	6	..	17
35	1	10	3	..	..	5	1	20
36	2	11	11	..	..	8	..	32
37	..	16	7	..	1	8	..	32
38	2	17	6	..	..	11	1	37
39	1	16	2	..	..	6	1	26
40	3	18	13	..	1	8	..	43
41	..	16	6	..	1	7	1	31
42	7	16	1	..	3	8	3	38
43	2	21	6	..	1	6	2	38
44	5	21	7	..	..	3	4	40
45	3	33	7	1	1	5	1	51
46	3	24	11	..	2	11	1	52
47	4	27	16	..	..	18	1	66
48	1	26	7	..	2	18	..	54
49	4	36	6	..	..	11	1	58
50	2	28	13	..	1	14	1	59
51	3	38	4	..	..	10	1	56
52	2	34	6	..	2	13	2	59
53	..	43	10	..	2	14	3	72
54	3	30	7	..	1	8	1	50
55	3	26	9	..	2	6	..	46
56	5	30	6	..	2	11	2	56
57	7	31	8	..	..	4	1	51
58	5	26	9	2	..	11	..	53
59	2	25	4	..	2	9	1	43

Table 24 (concluded)

Ordinary Mortality Experience of The Prudential Insurance Company of America

Mortality from Cancer, by Organs and Parts at Single Years of Life, Males 1886-1913

Age	Buccal Cavity	Stomach and Liver	Peritoneum Intestines Rectum	Breast	Skin	Other Organs	Organs not Specified	Total
60	2	28	4	..	1	8	..	43
61	3	29	10	..	1	8	4	55
62	3	22	7	..	..	9	3	44
63	1	21	7	..	..	3	1	33
64	1	14	4	..	3	3	..	25
65	1	23	6	..	..	8	1	39
66	1	13	4	..	1	7	3	29
67	1	12	6	..	..	6	1	26
68	..	8	3	..	..	4	..	15
69	..	8	1	..	..	2	..	11
70	1	4	1	..	..	4	..	10
71	..	5	2	..	..	3	..	10
72	1	5	1	..	..	..	1	8
73	..	..	1	..	..	1	..	2
74	..	..	..	..	..	1	..	1
75	..	3	..	..	..	..	..	3
76	..	2	..	..	..	..	..	2
77	..	1	..	..	..	1	..	2
Total	89	860	274	3	32	354	51	1,663

Table 25

Ordinary Mortality Experience of The Prudential Insurance Company of America

Mortality from Cancer, by Organs and Parts at Single Years of Life, Females 1886-1913

Age	Buccal Cavity	Stomach and Liver	Peritoneum Intest. Rectum	Female Gener. Organs	Breast	Skin	Other Organs	Organs not Specified	Total
19	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..
21	..	..	..	1	..	..	..	..	1
22	..	..	..	1	..	..	2	..	3
23	..	..	..	1	..	..	..	..	1
24	..	..	..	..	..	..	..	..	..
25	..	..	2	..	..	..	..	..	2
26	..	..	..	..	..	..	..	..	..
27	..	1	..	..	..	..	..	..	1
28	..	..	2	1	..	..	..	..	3
29	..	2	..	2	..	..	2	..	6
30	..	1	1	3	..	..	3	..	8
31	..	1	1	3	1	..	1	1	8
32	..	1	1	4	2	..	1	..	9
33	..	3	..	4	4	1	..	..	12
34	..	2	3	4	2	..	..	3	14
35	..	2	1	8	1	..	3	1	16
36	..	3	2	5	3	..	1	..	14
37	..	2	1	7	7	..	1	2	20
38	..	6	..	9	4	..	3	..	22
39	..	4	7	5	1	..	3	1	21
40	..	2	1	13	5	..	3	2	26
41	..	3	5	9	4	..	2	..	23
42	..	4	3	16	7	..	2	2	34
43	..	2	1	8	7	..	3	1	22
44	..	10	6	9	3	..	3	3	34
45	..	7	..	16	4	..	1	2	30
46	..	6	2	15	7	..	1	3	34
47	..	6	4	9	8	..	7	1	35
48	..	7	4	12	7	..	5	1	36
49	..	7	2	6	3	1	1	..	20
50	..	2	7	7	5	..	1	..	22
51	..	7	2	5	3	1	2	..	20
52	..	7	2	12	4	..	3	..	28
53	..	7	7	10	6	..	1	2	33
54	..	9	1	3	2	..	2	1	18
55	..	5	3	8	4	..	1	1	22
56	..	4	2	9	..	..	4	1	20
57	..	10	3	5	1	..	..	2	21
58	..	9	3	8	1	..	1	..	22
59	..	5	1	5	2	1	2	..	16

Table 25 (concluded)

nary Mortality Experience of The Prudential Insurance Company of America

tality from Cancer, by Organs and Parts at Single Years of Life, Females 1886-1913

	Buccal Cavity	Stomach and Liver	Peritoneum Intest. Rectum	Female Gener. Organs	Breast	Skin	Other Organs	Organs not Specified	Total
.....	..	2	1	1	..	..	..	1	5
.....	..	5	3	6	2	..	..	1	17
.....	..	4	1	8	2	..	..	..	15
.....	..	2	1	2	1	..	1	1	8
.....	..	4	4	1	..	..	1	..	10
.....	..	1	3	1	1	..	..	..	6
.....	..	5	..	..	1	..	..	..	6
.....	..	4	..	..	..	1	1	..	6
.....	..	1	1	1	1	..	..	..	4
.....	..	..	..	1	1	..	..	..	2
.....	..	2	..	..	..	..	1	..	3
.....	..	1	1	..	..	..	..	..	2
.....	..	..	..	..	1	..	1	..	2
.....	..	1	..	..	..	..	..	..	1
otal..	..	179	95	264	118	5	70	33	764

APPENDIX D

Table 26

Ordinary Mortality Experience of The Prudential Insurance Company of America

Anthropometry in Mortality from Cancer, Males

Weights and Age at Entry

1886-1912

Weight at Entry	Ages at Entry 15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 and Over	Total
DISTRIBUTION PER 10,000 DEATHS FROM CANCER												
Under 110....	..	7	..	..	..	..	..	..	..	..	..	7
110–119......	7	..	7	14	21	..	7	21	7	7	..	91
120–129......	14	57	21	50	57	29	29	..	29	..	..	286
130–139......	21	43	64	107	215	172	129	150	79	21	7	1,008
140–149......	14	57	157	229	301	309	394	236	150	79	14	1,940
150-159......	..	57	143	186	215	323	215	352	215	72	7	1,785
160–169......	..	50	93	114	280	337	287	266	114	136	43	1,720
170–179......	..	14	79	150	179	250	143	207	122	64	..	1,208
180–189......	..	21	36	29	150	157	143	122	86	43	14	801
190–199......	..	7	14	43	79	107	93	100	57	36	..	536
200–209......	..	7	..	21	43	64	64	43	43	29	..	314
210–219......	..	..	7	14	14	29	64	14	36	..	..	178
220–229......	..	..	7	..	14	14	14	7	7	..	..	63
230–239......	..	..	7	..	7	..	14	7	14	7	..	56
240–249......	..	..	..	..	..	..	..	..	..	..	..	..
250–259......	..	..	..	..	..	..	..	..	..	..	..	..
260 and over..	..	..	..	..	..	..	..	7	..	..	..	7
Total....	56	320	635	957	1,575	1,791	1,596	1,532	959	494	85	10,000
DISTRIBUTION PER 10,000 DEATHS FROM ALL CAUSES												
Under 110....	16	3	2	3	2	1	..	1	1	..	..	29
110–119......	32	25	22	9	11	5	6	7	4	2	1	124
120–129......	78	126	92	75	57	39	31	22	15	10	1	546
130–139......	103	256	266	215	180	120	100	78	57	21	5	1,401
140–149......	106	305	339	289	245	203	171	130	104	46	8	1,946
150–159......	51	252	316	299	256	219	173	143	103	37	6	1,855
160–169......	24	158	223	258	257	221	162	133	94	37	8	1,575
170–179......	6	71	137	160	160	135	115	94	75	24	6	983
180–189......	4	33	82	81	107	106	93	76	70	21	6	679
190–199......	..	14	30	57	68	62	58	48	36	15	3	391
200–209......	..	5	15	31	29	41	34	25	21	9	2	212
210–219......	..	2	6	19	23	19	27	21	13	6	1	137
220–229......	..	1	4	7	10	16	15	13	5	2	..	73
230–239......	..	..	2	5	6	5	5	3	5	2	..	33
240–249......	..	..	..	2	2	2	1	2	1	1	..	11
250–259......	..	..	1	2	1	..	..	..	..	..	..	4
260 and over..	..	..	..	..	..	..	..	1	..	..	..	1
Total....	420	1,251	1,537	1,512	1,414	1,194	991	797	604	233	47	10,000

APPENDIX D

Table 27

Ordinary Mortality Experience of The Prudential Insurance Company of America

Family History in Mortality, Cancer Compared with Tuberculosis, Males 1886-1912

DISTRIBUTION PER 10,000 DEATHS FROM CANCER

	Age of Insured at Death						
Age of Father at His Death	20-29	30-39	40-49	50-59	60-69	70-79	Total
20-29	10	39	29	39	10	10	137
30-39	19	58	155	155	107	19	513
40-49	58	136	214	408	291	29	1,136
50-59	29	204	495	505	320	21	1,574
60-69	39	262	932	1,097	544	87	2,961
70-79	10	165	553	1,039	689	87	2,543
80-89	..	49	214	427	301	19	1,010
90-99	..	10	..	58	39	19	126
Total	165	923	2,592	3,728	2,301	291	10,000
Age of Mother at Her Death	20-29	30-39	40-49	50-59	60-69	70-79	Total
20-29	..	..	68	113	34	11	226
30-39	11	169	248	259	180	23	890
40-49	45	248	417	530	316	..	1,556
50-59	11	214	519	496	225	23	1,488
60-69	..	169	710	1,026	440	56	2,401
70-79	..	90	372	981	936	68	2,447
80-89	..	23	113	293	316	79	824
90-99	..	..	11	56	90	11	168
Total	67	913	2,458	3,754	2,537	271	10,000

DISTRIBUTION PER 10,000 DEATHS FROM TUBERCULOSIS OF THE LUNGS

Age of Father at His Death	20-29	30-39	40-49	50-59	60-69	70-79	Total
20-29	66	69	21	17	..	..	173
30-39	345	324	204	72	17	..	962
40-49	770	787	390	173	35	..	2,155
50-59	614	1,022	639	207	52	3	2,537
60-69	293	808	680	352	97	17	2,247
70-79	93	352	452	345	76	14	1,332
80-89	17	86	173	173	55	7	511
90-99	..	17	35	21	10	..	83
Total	2,198	3,465	2,594	1,360	342	41	10,000
Age of Mother at Her Death	20-29	30-39	40-49	50-59	60-69	70-79	Total
20-29	153	134	81	32	5	..	405
30-39	599	604	396	167	27	9	1,802
40-49	676	887	450	189	59	5	2,266
50-59	387	910	568	234	50	13	2,162
60-69	90	604	725	410	85	5	1,919
70-79	18	126	432	423	153	23	1,175
80-89	..	14	54	108	54	..	230
90-99	..	5	18	14	4	..	41
Total	1,923	3,284	2,724	1,577	437	55	10,000

APPENDIX D

Table 28

Mortality Experience of American Life Insurance Companies
Medico-Actuarial Mortality Investigation, New York, 1913
Mortality from Cancer, according to Build, Males
1885-1908

	Overweight 50 Pounds and More		Standard Lives		Underweight 25 Pounds and More	
Age at Entry	Deaths from Cancer	Rate per 10,000 Exposed to Risk	Deaths from Cancer	Rate per 10,000 Exposed to Risk	Deaths from Cancer	Rate per 10,000 Exposed to Risk
15–29	6	0.9	95	1.0	39	0.8
30–44	87	3.7	377	3.2	242	2.4
45 and over	107	15.6	411	14.4	216	12.0
		Cancer Per Cent. of All Causes		Cancer Per Cent. of All Causes		Cancer Per Cent. of All Causes
15–29		1.7		2.1		1.4
30–44		3.4		4.8		3.4
45 and over		6.0		7.7		7.3

Source: Medico-Actuarial Mortality Investigation, Vol. II, p. 34. New York, 1913.

Table 29

Mortality Experience of American Life Insurance Companies
Medico-Actuarial Mortality Investigation, New York, 1913
Mortality from Cancer and other Malignant Tumors, by Sex
1885-1908

	Number of Policies Terminated by Death			Percentage of All Deaths			Rate per 10,000 Exposed to Risk		
Policy Years	Ages at Entry 15-29	30-44	45-over	Ages at Entry 15-29	30-44	45-over	Ages at Entry 15-29	30-44	45-over
MALES									
1	4	7	15	0.6	1.0	3.5	0.2	0.4	3.2
2	4	25	42	0.7	3.6	9.4	0.3	1.9	12.0
3–5	18	72	111	1.4	3.9	8.9	0.7	2.3	13.6
6–10	30	105	129	2.5	4.7	7.8	1.2	3.3	16.4
11–24	39	168	114	4.1	7.0	7.3	2.3	7.6	26.3
Total	95	377	411	2.1	4.8	7.7	1.0	3.2	14.4
FEMALES									
1	7	50	55	1.1	6.4	13.6	0.5	3.0	12.1
2	5	52	64	0.9	6.9	15.8	0.5	4.0	18.1
3–5	24	199	196	1.9	11.0	15.2	1.0	6.6	23.5
6–10	26	240	212	3.0	15.6	13.1	1.6	10.3	28.8
11–24	36	127	127	11.5	16.3	10.5	7.2	15.4	40.7
Total	98	668	654	2.7	11.8	13.3	1.4	7.3	24.3

Source: Medico-Actuarial Mortality Investigation, Vol. II, p. 31, et seq. New York, 1913

APPENDIX D

Table 30

tality Experience of Twenty-seven American Insurance Companies (Meech) from Organization to 1873

Mortality from Cancer, with Distinction of Age and Sex

Ages	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
	MALES AND FEMALES		
10–19	151	..	..
20–29	3,836	9	0.2
30–39	10,019	77	0.8
40–49	11,403	210	1.8
50–59	7,893	255	3.2
60–69	3,521	111	3.2
70–79	698	22	3.2
80 and over	103	..	..
Total	37,624	684	1.8
	MALES		
10–19	133	..	..
20–29	3,476	8	0.2
30–39	9,321	72	0.8
40–49	10,840	186	1.7
50–59	7,576	239	3.2
60–69	3,357	107	3.2
70–79	647	20	3.1
80 and over	92	..	..
Total	35,442	632	1.8
	FEMALES		
10–19	18	..	..
20–29	360	1	0.3
30–39	698	5	0.7
40–49	563	24	4.3
50–59	317	16	5.0
60–69	164	4	2.4
70–79	51	2	3.9
80 and over	11	..	..
Total	2,182	52	2.4

APPENDIX D

Table 31

Mortality Experience of The Aetna Life Insurance Company

Mortality from Cancer

1870-1913

Year	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
1870	426	11	2.6
1871	432	7	1.6
1872	486	8	4.6
1873	579	18	3.1
1874	474	10	2.1
1875	527	16	3.0
1876	536	14	2.6
1877	544	15	2.8
1878	502	20	4.0
1879	532	23	4.3
1880	542	23	4.2
1881	503	20	3.4
1882	565	23	4.1
1883	656	37	5.6
1884	645	27	4.2
1885	667	30	4.5
1886	715	36	5.0
1887	719	34	4.9
1888	783	23	2.9
1889	761	37	4.9
1890	817	34	4.2
1891	897	45	5.0
1892	1,019	51	5.0
1893	1,013	48	4.7
1894	956	53	5.5
1895	1,052	40	3.8
1896	1,029	40	3.9
1897	1,044	55	5.3
1898	1,051	48	4.6
1899	1,114	54	4.8
1900	1,215	83	6.8
1901	1,303	84	6.4
1902	1,267	55	4.3
1903	1,386	87	6.3
1904	1,432	70	4.9
1905	1,388	97	7.0
1906	1,514	111	7.3
1907	1,536	104	6.8
1908	1,504	117	7.8
1909	1,605	112	7.0
1910	1,783	122	6.8
1911	1,702	127	7.5
1912	1,628	123	7.6
1913	1,658	117	7.1
1870–1890	12,411	466	3.8
1891–1913	30,096	1,843	6.1

APPENDIX D

Table 32

Mortality Experience of The Mutual Life Insurance Company of New York
Mortality from Cancer, by Age and Sex
1843-1914

Ages	MALES Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.	FEMALES Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
Under 20	252	3	1.19	18	..	..
20-24	1,874	15	0.80	151	2	1.32
25-29	4,693	48	1.02	413	4	0.97
30-34	7,258	106	1.46	647	18	2.78
35-39	10,058	269	2.67	720	56	7.78
40-44	11,750	469	3.99	802	104	12.97
45-49	13,103	690	5.27	764	136	17.80
50-54	14,001	1,005	7.18	730	136	18.63
55-59	14,300	1,112	7.78	725	138	19.03
60-64	13,668	1,086	7.95	701	97	13.84
65-69	12,625	875	6.93	612	71	11.60
70-74	10,152	628	6.19	448	46	10.27
75-79	7,382	386	5.23	339	15	4.42
80-84	4,071	130	3.19	163	7	4.29
85 and over	1,870	52	2.78	69	..	..
Total	127,079*	6,874	5.41	7,303†	830	11.37

Source: Report on the Mortality Records of The Mutual Life Insurance Company of New York from 1843 to 1898. New York, 1900. 1899–1914, courtesy of Brandreth Symonds, Chief Medical Director of The Mutual Life Insurance Company of New York.

*Including 22 age not stated. †Including 1 age not stated.

Table 33

Mortality Experience of The Mutual Life Insurance Company of New York
Mortality from Cancer, by Age and Sex
1843-1914

	All Ages			Under 45			45 and Over		
	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
MALES									
1843–1873	5,223*	94	1.80	2,674	25	0.93	2,527	69	2.72
1874–1885	10,839	449	4.14	3,028	71	2.34	7,811	378	4.84
1886–1893	14,568	631	4.33	3,658	65	1.78	10,910	566	5.19
1894–1898	14,355	708	4.93	4,263	95	2.23	10,092	613	6.07
1899–1914	82,094	4,992	6.09	22,262	654	2.94	59,832	4,338	7.25
1843–1914	127,079*	6,874	5.41	35,885	910	2.54	91,172	5,964	6.54
FEMALES									
1843–1873	162†	8	4.94	76	5	6.58	85	3	3.53
1874–1885	247	24	9.72	74	4	5.41	173	20	11.56
1886–1893	456	45	9.87	147	10	6.80	309	35	11.33
1894–1898	675	50	7.41	265	6	2.26	410	44	10.73
1899–1914	5,763	703	12.23	2,189	159	7.26	3,574	544	15.22
1843–1914	7,303†	830	11.37	2,751	184	6.69	4,551	646	14.19

Source: Report on the Mortality Records of The Mutual Life Insurance Company of New York from 1843 to 1898. New York, 1900. 1899–1914, courtesy of Brandreth Symonds, Chief Medical Director of The Mutual Life Insurance Company of New York.

*Including 22 age not given. †Including 1 age not stated.

APPENDIX D

Table 34

Mortality Experience of The Mutual Life Insurance Company of New Y
Mortality from Other Tumors, by Age and Sex
1843-1898

Ages	MALES Deaths from All Causes	MALES Deaths from Tumor	MALES Tumor Per Cent.	FEMALES Deaths from All Causes	FEMALES Deaths from Tumor	FEMALES Tu Per
Under 20.............	38	..	..	2	..	
20–24................	569	..	..	30	..	
25–29................	1,775	4	0.23	78	..	
30–34................	2,900	5	0.17	136	1	0.
35–39................	4,034	18	0.45	141	..	
40–44................	4,307	12	0.28	175	2	1.
45–49................	4,621	17	0.37	156	..	
50–54................	4,944	13	0.26	159	..	
55–59................	5,283	9	0.17	185	..	
60–64................	5,016	12	0.24	160	2	1.
65–69................	4,593	16	0.35	122	2	1.
70–74................	3,406	10	0.29	71	1	1.
75–79................	2,212	1	0.05	92	..	
80–84................	956	1	0.10	25	..	
85 and over...........	309	2	0.65	7	..	
Total............	44,985*	120	0.27	1,540†	8	0.

Source: Report on the Mortality Records of The Mutual Life Insurance Compan New York from 1843 to 1898. New York, 1900.

*Including 22 age not stated. †Including 1 age not stated.

Table 35

Mortality Experience of The New York Life Insurance Company
Mortality from Cancer and Other Tumors
1901-1913

Year	Deaths from All Causes	Deaths from Cancer and Other Tumors	Per Cent.
1901........	4,593	206	4.5
1902........	5,094	253	5.0
1903........	5,573	289	5.2
1904........	6,632	339	5.1
1905........	7,701	370	4.8
1906........	7,244	384	5.3
1907........	7,593	401	5.3
1908........	7,568	480	6.3
1909........	7,719	575	7.4
1910........	8,039	588	7.3
1911........	8,314	606	7.3
1912........	8,549	631	7.4
1913........	8,793	660	7.5

Furnished by Mr. Arthur Hunter, Actuary of The New York Life Insurance Company.

APPENDIX D

Table 36

Mortality Experience of The Northwestern Mutual Life Insurance Company
Mortality from Cancer, by Age, Males
1857-1909

	1857–1885			1886–1909		
Ages	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
Under 20	22	..	..	32	..	..
20–29	388	..	..	2,195	24	1.1
30–39	1,099	18	1.6	4,832	107	2.2
40–49	1,541	59	3.8	6,327	335	5.3
50–59	1,381	63	4.6	6,624	525	7.9
60–69	792	39	4.9	5,982	529	8.8
70–79	141	6	4.3	3,897	248	6.4
80 and over	3	..	..	1,172	32	2.7
Total	5,367	185	3.4	31,061	1,800	5.8

Table 37

Mortality Experience of The Washington Life Insurance Company
Mortality from Cancer, by Age
1860-1886

Ages	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
19–29	139	1	0.7
30–39	413	5	1.2
40–49	593	15	2.5
50–59	451	24	5.3
60–69	303	18	5.9
70–81	101	5	4.9
Total	2,000	68	3.4

Source: The Washington Life Insurance Company: Historical, Actuarial and Medical Statistics. New York, 1889.

Note—During this same period there were seven deaths from tumors, the deaths from this cause representing 0.35% of the total mortality.

Table 38

Mortality from Cancer in Foreign Life Insurance Companies

Number of Companies	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent
16 German companies	137,609	15,191	11.0
1 Swiss company	1,253	129	10.3
1 Japanese company	7,473	709	9.5
13 Austrian companies	85,334	8,052	9.4
1 Dutch East Indian company	161	15	9.3
1 Hungarian company	3,117	253	8.1
1 British Indian company	1,435	22	1.5

Source: Annual Reports of the several companies.

APPENDIX D

Table 39

Mortality from Cancer in the Experience of Thirty-four Insurance Companies

No	Period	Companies	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
1.	1903–1912	Gothaer Lebensversicherungsbank, Gotha, Germany	20,030	2,518	12.6
2.	1907–1912	Deutsche Lebensversicherung, Potsdam, Germany	4,092	510	12.5
3.	1893–1913	Leipziger Lebensversicherungs - Gesellschaft, Leipzig, Germany	22,456	2,770	12.3
4.	1905–1912	Teutonia Versicherungs - Actien - Gesellschaft, Leipzig, Germany	9,780	1,166	11.9
5.	1906–1913	Deutsche Lebensversicherungs - Gesellschaft, Lübeck, Germany	6,729	791	11.8
6.	1901–1906	Stuttgarter Lebensversicherungsbank, Stuttgart, Germany	6,953	817	11.8
7.	1907–1913	"Concordia" Mutual Life Insurance Company, Reichenberg, Austria	1,018	118	11.6
8.	1900–1912	Erster Allgemeiner Beamten-Verein der Österreichisch-Ungarischen Monarchie, Vienna, Austria	17,507	2,000	11.4
9.	1896–1913	Friedrich Wilhelm, Berlin, Germany	10,332	1,113	10.8
10.	1900–1905	Karlsruher Lebensversicherung, Karlsruhe, Germany	6,790	723	10.6
11.	1908–1912	"Donau," Vienna, Austria	2,164	227	10.5
12.	1901–1913	"La Suisse" Société d'Assurances sur la vie et contre les accidents, Lausanne, Switzerland	1,253	129	10.3
13.	1901–1913	Magdeburger Lebensversicherungs - Gesellschaft, Magdeburg, Germany	10,215	1,039	10.2
14.	1907–1912	"Janus" Mutual Life Insurance Company, Vienna, Austria	3,678	370	10.1
15.	1896–1913	Lebens - und Pensions - Versicherungs - Gesellschaft "Janus," Hamburg, Germany	9,172	921	10.0
16.	1907–1913	"Freia" Bremen-Hannoversche Lebensversicherungs-Bank, Hanover, Germany	3,981	387	9.7
17.	1900–1907	"Praha" Mutual Life Insurance Company, Prague, Austria	1,424	138	9.7
18.	1908–1911	Lebensversicherungs-Anstalt und Sterbekasse des Deutschen Kriegerbundes, Berlin, Germany	6,513	625	9.6
19.	1903–1906	Sächsischer Militär Lebensversicherungs-Verein, Dresden, Germany	2,419	230	9.5
20.	1901–1912	Österreichischer Phoenix, Life Insurance Company, Vienna, Austria	10,624	1,008	9.5
21.	1899–1912	Assicurazioni Generali, Trieste, Austria	15,622	1,461	9.4
22.	1911–1913	Nederlandsch - Indische Lebensverzekeringen Lijfrente Maatschappij, Batavia, Dutch East Indies	161	15	9.3
23.	1905–1912	Mutual Insurance Company, Krakau, Austria	4,174	385	9.2
24.	1907–1912	"Universale" Industrial Insurance Company, Vienna, Austria	8,594	790	9.2

Table 39 (concluded)
Mortality from Cancer in the Experience of Thirty-four Insurance Companies

No.	Period	Companies	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
25.	1903–1913	"Victoria" zu Berlin, Insurance Company, Berlin, Germany	15,733	1,385	8.8
26.	1904–1912	Niederösterreichische Landes - Lebens und Renten-Versicherungs-Anstalt, Vienna, Austria	1,451	126	8.7
27.	1899–1912	Riunione Adriatica di Sicurta, Trieste, Austria	9,454	811	8.6
28.	1906–1913	"Deutschland" Life Insurance Company, Berlin, Germany	2,010	168	8.4
29.	1900–1912	"Foncière" Pester Versicherungs-Anstalt, Budapest, Hungary	3,117	253	8.1
30.	1906–1912	Landes-Lebensversicherungs-Anstalt der Markgrafschaft Maehren, Bruenn, Austria	1,466	104	7.1
31.	1904–1913	"Atlas" Life Insurance Company, Ludwigshafen, Germany	404	28	6.9
32.	1901–1913	Lebens-und Rentenversicherungs-Gesellschaft "Der Anker," Vienna, Austria	8,158	514	6.3
33.	1911–1912	Oriental Government Security Life Assurance Company, Ltd., Bombay, British India	1,435	22	1.5
34.	1899–1907	Meiji Life Assurance Company, Tokio, Japan	7,473	709	9.5

Source: Annual Reports of the several companies.

Table 40
Mortality Experience of The British Empire Mutual Life Assurance Company Mortality from Cancer and Tumor, by Age 1847-1872

		Cancer		Tumor	
Ages	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.	Deaths from Tumor	Tumor Per Cent.
Under 20	5	..	..	..	..
20–24	34	..	..	..	..
25–29	100	..	..	1	1.0
30–34	170	1	0.6	..	..
35–39	247	..	..	2	0.8
40–44	272	8	2.9	3	1.1
45–49	280	9	3.2	2	0.7
50–54	271	9	3.3	3	1.1
55–59	230	11	4.8	2	0.9
60–64	153	1	0.7	1	0.7
65–69	112	3	2.7	..	..
70–74	73	1	1.4	..	..
75–79	35	..	..	..	..
80 and over	17	..	..	..	..
Total	1,999	43	2.2	14	0.7

Source: Tables of the Mortality Experience of The British Empire Mutual Life Assurance Company from 1847 to 1884.

APPENDIX D

Table 41
Mortality Experience of The British Empire Mutual Life Assurance Company
Mortality from Cancer and Tumor, by Age
1873-1878

Ages	Deaths from All Causes	Cancer: Deaths from Cancer	Cancer: Cancer Per Cent.	Tumor: Deaths from Tumor	Tumor: Tumor Per Cent.
Under 25	3	..	..	..	..
25–29	24	..	..	..	..
30–34	49	1	2.0	..	..
35–39	80	1	1.3	1	1.3
40–44	87	2	2.3	..	..
45–49	109	2	1.8	1	0.9
50–54	154	4	2.6	1	0.6
55–59	185	9	4.9	1	0.5
60–64	183	6	3.3	1	0.5
65–69	147	6	4.1	..	..
70–74	94	3	3.2	..	..
75–79	38	1	2.6	1	2.6
80 and over	26	1	3.8	..	..
Total	1,179	36	3.1	6	0.5

Mortality Experience, Publicans Only, 1846-1876

1846-1876	123	2	1.6	1	0.8

Mortality Experience, 1879-1884

1879-1884	1,300	42	3.2	10	0.8

Source: Tables of the Mortality Experience of The British Empire Mutual Life Assurance Company from 1847 to 1884.

Table 42
Mortality Experience of The Clergy Mutual Assurance Society
Mortality from Cancer, by Age, 1829-1887

Ages	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
Under 20	1	..	..
20–29	45	..	..
30–39	164	4	2.4
40–49	272	17	6.3
50–59	478	25	5.2
60–69	562	33	5.9
70–79	444	21	4.7
80–89	147	2	1.4
90 and over	6	..	..
Total	2,119	102	4.8

Source: Report on the Mortality Experience of The Clergy Mutual Assurance Society from 1829 to 1887. London, 1891.

Note: During this same period there were six deaths from tumor in the experience o The Clergy Mutual Assurance Society, 2, or 0.7, at ages 40-49; 1, or 0.2, at ages 50-59; 1, o 0.2, at ages 60-69; and 2, or 0.5, at ages 70-79.

APPENDIX D

Table 43

Mortality Experience of The Clergy Mutual Assurance Society
Mortality of Persons Assured as "Unhealthy Lives," 1829-1887

	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
:0..................................	..	..	..
....	1	..	..
....	4	..	..
....	11	..	..
....	30	2	6.7
....	14	..	..
....	10	..	..
....	1	..	..
ver................................	..	..	..
....	71	2	2.8

ce: Report on the Mortality Experience of The Clergy Mutual Assurance from 1829 to 1887. London, 1891.

Table 44

Mortality Experience of The Equitable Society, London, Eng.
Cancer Mortality, 1801-1832

Ages	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
10–19.......	12	..	..
20–29.......	67	..	..
30–39.......	266	2	0.8
40–49.......	544	5	0.9
50–59.......	883	14	1.6
60–69.......	1,173	15	1.3
70–79.......	856	4	0.5
80 and over...	294	3	1.0
Total......	4,095	43	1.1

Source: Tables showing the total number of persons assured in The Equitable Society from its commencement in September, 1762, to January 1, 1829, and a supplement showing the mortality of the Society for the years 1829 to 1832. London, 1834.

APPENDIX D

Table 45
Mortality Experience of The Gresham Life Assurance Society
Mortality from Cancer and Tumor, by Age
Up to July 15, 1866

Ages	Cancer			Tumor		
	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.	Deaths from All Causes	Deaths from Tumor	Tumor Per Cent.
Under 20	10	..	..	10	..	..
20–29	73	1	1.4	73	..	..
30–39	268	3	1.1	268	1	0.4
40–49	263	6	2.3	263	1	0.4
50–59	225	7	3.1	225	1	0.4
60–69	107	3	2.8	107	1	0.9
70–79	54	1	1.9	54	..	..
Total	1,000	21	2.1	1,000	4	0.4

Source: Gresham Life Assurance Society, The Causes of Death, tabulated by A. H. Smee, 1868.

Table 46
Mortality Experience of The Metropolitan Life Assurance Society, England
Mortality from Cancer and Tumor, by Age
1835-1864

Ages	Deaths from All Causes	Cancer		Tumor	
		Deaths from Cancer	Cancer Per Cent.	Deaths from Tumor	Tumor Per Cent.
Under 20	2	..	..	..	..
20–29	22	..	..	1	4.5
30–39	77	1	1.3	..	..
40–49	147	2	1.4	..	..
50–59	176	3	1.7	1	0.6
60–69	173	5	2.9	..	..
70–79	60	5	8.3	..	..
80 and over	14	..	..	..	..
Total	671	16	2.4	2	0.3

Source: Metropolitan Life Assurance Society, Mortality Experience from 1835 to 1864.

Table 47

ality Experience of The Prudential Assurance Company, London, Eng.
Mortality from Cancer, by Age and Sex
1867-1870

	MALES			FEMALES		
	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
5..............	7,568	6	0.08	6,941	8	0.12
....	1,405	2	0.14	1,327	1	0.08
....	687	1	0.15	620	..	..
....	1,392	2	0.14	1,445	4	0.28
....	760	6	0.79	981	6	0.61
....	2,290	39	1.70	2,312	166	7.18
over...........	3,297	82	2.49	4,147	167	4.03
otal...........	17,399	138	0.79	17,773	352	1.98

ırce: Mortality Experience of The Prudential Assurance Company in the Indus-
ranch for the years 1867 to 1870. London, 1871.

Table 48

ality Experience of The Prudential Assurance Company, London, Eng.
Mortality from Tumor, by Age and Sex
1867-1870

	MALES			FEMALES		
	Deaths from All Causes	Deaths from Tumor	Tumor Per Cent.	Deaths from All Causes	Deaths from Tumor	Tumor Per Cent.
5..............	7,568	..	..	6,941	1	0.01
....	1,405	..	..	1,327	4	0.30
....	687	1	0.14	620	..	..
....	1,392	1	0.07	1,445	2	0.14
....	760	1	0.13	981	1	0.10
....	2,290	5	0.22	2,312	21	0.91
over...........	3,297	8	0.24	4,147	18	0.43
otal...........	17,399	16	0.09	17,773	47	0.26

ırce: Mortality Experience of The Prudential Assurance Company in the Indus-
ranch for the years 1867 to 1870. London, 1871.

APPENDIX D

Table 49

Mortality Experience of The Prudential Assurance Company, London, Eng.
Mortality from Cancer, by Organs and Parts, according to Age
1867-1870

MALES

Organ or Part	All Ages: Deaths from Cancer	All Ages: Per Cent.	Under 15: Deaths from Cancer	Under 15: Per Cent.
Head, face, mouth, tongue, eyes and ears	30	21.7	4	44.4
Breast	1	0.7	..	..
Stomach	30	21.7	..	..
Liver	24	17.4	..	..
Rectum	8	5.8	..	..
Not defined	45	32.6	5	55.6
All organs	138	100.0	9	100.0
	15–24		25–34	
Head, face, mouth, tongue, eyes and ears	..	..	1	16.7
Breast	..	..	..	..
Stomach	..	..	1	16.7
Liver	..	..	2	33.3
Rectum	..	..	..	..
Not defined	2	100.0	2	33.3
All organs	2	100.0	6	100.0
	35–54		55 and Over	
Head, face, mouth, tongue, eyes and ears	7	17.9	18	22.0
Breast	..	..	1	1.2
Stomach	6	15.4	23	28.0
Liver	10	25.6	12	14.6
Rectum	3	7.7	5	6.1
Not defined	13	33.3	23	28.0
All organs	39	100.0	82	100.0

Source: Mortality Experience of The Prudential Assurance Company in the Industrial Branch for the years 1867 to 1870. London, 1871.

APPENDIX D

Table 50

lity Experience of The Prudential Assurance Company, London, Eng.
Mortality from Cancer, by Organs and Parts, according to Age
1867-1870

FEMALES

)rgan or Part	All Ages: Deaths from Cancer	All Ages: Per Cent.	Under 15: Deaths from Cancer	Under 15: Per Cent.
ace, mouth, tongue, eyes and ears	24	6.8	8	88.9
	55	15.6	..	..
·h	39	11.1	..	..
	25	7.1	..	..
ı	5	1.4	..	..
s and bladder	2	0.6	..	..
	127	36.1	..	..
	1	0.3	..	..
	1	0.3	..	..
fined	73	20.7	1	11.1
ıns	352	100.0	9	100.0

	15–24: Deaths from Cancer	15–24: Per Cent.	25–34: Deaths from Cancer	25–34: Per Cent.
'ace, mouth, tongue, eyes and ears	1	25.0	..	..
	..	..	2	33.3
:h	2	50.0	1	16.7
	..	..	1	16.7
a	..	..	..	..
's and bladder	..	..	..	..
	..	..	2	33.3
	..	..	..	..
	..	..	..	..
fined	1	25.0	..	..
ans	4	100.0	6	100.0

	35–54: Deaths from Cancer	35–54: Per Cent.	55 and Over: Deaths from Cancer	55 and Over: Per Cent.
face, mouth, tongue, eyes and ears	6	3.6	9	5.4
	20	12.0	33	19.8
:h	9	5.4	27	16.2
	11	6.6	13	7.8
a	3	1.8	2	1.2
's and bladder	1	0.6	1	0.6
	84	50.6	41	24.5
	..	..	1	0.6
	..	..	1	0.6
fined	32	19.3	39	23.3
;ans	166	100.0	167	100.0

rce: Mortality Experience of The Prudential Assurance Company in the Indus-
·anch for the years 1867 to 1870. London, 1871.

APPENDIX D

Table 51
Mortality Experience of The Scottish Amicable Life Assurance Society
Mortality from Cancer, by Age
1826-1860

Ages	Lives at Risk	Deaths from Cancer	Rate per 100,000 Lives
Under 25....	2,349	..	..
25–34.......	14,665	..	..
35–44.......	19,330	5	25.9
45–54.......	12,401	7	56.4
55–64.......	5,682	1	17.6
65 and over...	1,873	1	53.4
Total.....	56,300	14	24.9

Source: Medical Statistics of Life Assurance: Being an inquiry into the causes of death among the members of The Scottish Amicable Life Assurance Society from 1826 till 1860. Glasgow, 1862.

Table 52
Mortality Experience of The Scottish Amicable Life Assurance Society
Mortality from Cancer, by Age and Sex, Non-hazardous Occupations
1826-1860

	MALES			FEMALES		
Ages	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
Under 25.............	15	..	..	1	..	..
25–34................	90	..	..	9	..	..
35–44................	170	4	2.4	19	1	5.3
45–54................	147	5	3.4	8	2	25.0
55–64................	114	1	0.9	10	..	..
65–74................	79	1	1.3	13	..	..
75 and over..........	17	..	..	3	..	..
Total............	632	11	1.7	63	3	5.3

Source: Medical Statistics of Life Assurance: Being an inquiry into the causes of death among the members of The Scottish Amicable Life Assurance Society from 1826 till 1860. Glasgow, 1862.

APPENDIX D

Table 53

ality Experience of The Scottish Amicable Life Assurance Society
ality from Tumor, by Age and Sex, Non-Hazardous Occupations
1826-1860

	MALES		FEMALES	
	No. of Deaths	Per Cent.	No. of Deaths	Per Cent.
....	..	..	..	..
....	..	..	..	..
....	..	..	..	..
....	1	0.7	..	..
....	1	0.9	..	..
....	..	..	..	..
ver...................	..	..	..	..
l.....................	2	0.3	..	..

e: Medical Statistics of Life Assurance: Being an inquiry into the causes of ong the members of The Scottish Amicable Life Assurance Society from 1826 till lasgow, 1862.

Table 54

ality Experience of The Scottish Amicable Life Assurance Society
Mortality from Cancer, by Age, Hazardous Occupations
1826-1860

	Exclusive of West Indies			West Indies		
	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
....	1	..	..	..	..	..
....	7	..	..	6	..	..
....	10	..	..	9	..	..
....	11	..	..	12	..	..
....	10	..	..	4	..	..
....	8	..	..	..	..	..
ver	..	..	..	..	..	..
l............	47	..	..	31	..	..

e: Medical Statistics of Life Assurance: Being an inquiry into the causes of ong the members of The Scottish Amicable Life Assurance Society from 1826 till lasgow, 1862.

APPENDIX D

Table 55

Mortality Experience of The Scottish Union and National Insurance Company, 1912

Mortality from Cancer, by Organs and Parts

Organ or Part	Deaths from Cancer	Cancer Per Cent.
Mouth and throat	1	0.2
Larynx	1	0.2
Lung	5	1.1
Mediastinum	5	1.1
Stomach	4	0.9
Pancreas	1	0.2
Liver	1	0.2
Intestines	16	3.5
Peritoneum	1	0.2
Bladder	2	0.4
Prostate Gland	3	0.7
Vesicula seminalis	1	0.2
Uterus	1	0.2
Bone	1	0.2
Not stated	1	0.2
All organs	44	9.5

Source: Analysis of Deaths in The Scottish Union and National Insurance Company, 1912.

Note: All the above deaths are males except the one death from cancer of uterus.

Table 56

Mortality Experience of The Scottish Widows' Fund and Life Assurance Society

Mortality from Cancer and Tumor, by Age

1815-1845

Ages	Deaths from All Causes	Cancer: Deaths from Cancer	Cancer: Cancer Per Cent.	Tumor: Deaths from Tumor	Tumor: Tumor Per Cent.
20–30	28	..	..	..	..
30–40	109	..	..	2	1.8
40–50	143	2	1.4	..	..
50–60	143	2	1.4	2	1.4
60–70	123	2	1.6	..	..
70–80	57	..	..	1	1.8
Above 80	12	..	..	..	..
Unknown	27	..	..	..	..
Total	642	6	0.9	5	0.8

Source: Observations on the Mortality of The Scottish Widows' Fund and Life Assurance Society from 1815 to 1845. Edinburgh, 1847.

APPENDIX D

Table 57
y Experience of The Scottish Widows' Fund and Life Assurance Society
Mortality from Cancer and Tumor, by Age
1846-1852

	Deaths from All Causes	Cancer		Tumor	
		Deaths from Cancer	Cancer Per Cent.	Deaths from Tumor	Tumor Per Cent.
....	24	1	4.2	..	..
....	83	..	..	..	..
....	144	..	..	1	0.7
....	178	2	1.1	2	1.1
....	151	2	1.3	2	1.3
....	82	..	..	2	2.4
....	28	..	..	..	..
....	690	5	0.7	7	1.0

: Medical Statistics of Life Assurance, Observations on the Causes of Death
Assured of The Scottish Widows' Fund and Life Assurance Society from 1846
Edinburgh, 1853.

Table 58
y Experience of The Scottish Widows' Fund and Life Assurance Society
Mortality from Cancer and Tumor, by Age
1853-1859

	Deaths from All Causes	Cancer		Tumor	
		Deaths from Cancer	Cancer Per Cent.	Deaths from Tumor	Tumor Per Cent.
....	33	..	..	..	..
....	106	1	0.9	..	..
....	167	4	2.4	..	..
....	245	5	2.0	2	0.8
....	242	15	6.2	1	0.4
....	150	2	1.3	..	..
....	32	1	3.1	..	..
....	975	28	2.9	3	0.3

: On the Causes of Death in The Scottish Widows' Fund and Life Assurance
853-1859. Edinburgh, 1860.

APPENDIX D

Table 59

Mortality Experience of The Scottish Widows' Fund and Life Assurance Society
Proportionate Mortality from Cancer, by Age
1874-1880 Compared with 1888-1894

Ages	1874-1880 Cancer Per Cent.	1888-1894 Cancer Per Cent.	Variations
25–35	1.64	2.78	+1.14
35–45	8.20	8.73	+0.53
45–55	12.30	21.83	+9.53
55–65	33.60	31.75	−1.85
65–75	36.88	25.79	−11.09
75 and over	7.38	9.12	−1.74
Total	100.00	100.00	..

Source: The Causes of Death among the Assured in The Scottish Widows' Fund and Life Assurance Society from 1874 to 1894, inclusive. Edinburgh, 1902.

Table 60

Mortality Experience of The Scottish Widows' Fund and Life Assurance Society
Annual Mortality from Cancer among 100,000 Males Living at Each "Group of Ages," 1874-1894

Ages	1874-1880 Rate Per 100,000 Lives	1881-1887 Rate Per 100,000 Lives	1888-1894 Rate Per 100,000 Lives
25–34	5.1	4.2	14.9
35–44	21.9	23.7	29.5
45–54	47.2	73.4	90.2
55–64	207.8	258.9	245.3
65–74	469.8	336.7	451.8
75 and over	346.8	422.2	483.3
Total	78.6	81.9	104.2

Source: The Causes of Death among the Assured in The Scottish Widows' Fund and Life Assurance Society from 1874 to 1894, inclusive. Edinburgh, 1902.

APPENDIX D

Table 61

ty Experience of The Scottish Widows' Fund and Life Assurance Society

lortality from Cancer of Internal and External Organs, Males 1874-1894

'art	1874-1880 No.	1874-1880 %	1881-1887 No.	1881-1887 %	1888-1894 No.	1888-1894 %	1874-1894 No.	1874-1894 %
INTERNAL ORGANS								
....	28	24.56	33	21.85	50	20.24	111	21.68
....	23	20.18	28	18.55	42	17.00	93	18.17
....	5	4.39	15	9.93	23	9.31	43	8.40
....	7	6.14	13	8.60	14	5.67	34	6.64
....	5	4.39	3	1.99	8	3.24	16	3.13
ıum............	1	0.88	8	5.30	4	1.62	13	2.54
us..............	2	1.75	2	1.33	8	3.24	12	2.34
....	3	2.63	2	1.33	3	1.21	8	1.56
....	2	1.75	1	0.66	4	1.62	7	1.37
....	3	2.63	..	..	3	1.21	6	1.17
....	2	1.75	1	0.66	2	0.81	5	0.98
....	..	..	..	..	1	0.41	1	0.19
rd..............	..	..	1	0.66	..	..	1	0.19
s...............	81	71.05	107	70.86	162	65.58	350	68.36
EXTERNAL ORGANS								
....	12	10.52	26	17.22	30	12.14	68	13.28
....	8	7.02	2	1.33	13	5.26	23	4.49
....	4	3.51	5	3.31	8	3.24	17	3.32
....	3	2.63	1	0.66	5	2.02	9	1.76
....	1	0.88	1	0.66	6	2.43	8	1.56
....	..	..	1	0.66	6	2.43	7	1.37
....	1	0.88	2	1.33	2	0.81	5	0.96
....	3	2.63	1	0.66	1	0.41	5	0.98
....	..	..	1	0.66	4	1.62	5	0.98
....	1	0.88	2	1.33	1	0.41	4	0.78
....	..	..	..	..	4	1.62	4	0.78
....	..	..	..	..	2	0.81	2	0.39
....	..	..	1	0.66	1	0.41	2	0.39
....	..	..	..	..	2	0.81	2	0.39
....	..	..	1	0.66	..	..	1	0.19
s...............	33	28.95	44	29.14	85	34.42	162	31.64

e: The Causes of Death among the Assured in The Scottish Widows' Fund and ırance Society from 1874 to 1894, inclusive. Edinburgh, 1902.

APPENDIX D

Table 62
Mortality Experience of The Scottish Widows' Fund and Life Assurance Society
Annual Mortality from Cancer of Internal and External* Organs among 100,000 Males Living at All Ages, 1874-1894

Period	Internal Organs: Rate per 100,000 Lives	Internal Organs: Ratio	External Organs: Rate per 100,000 Lives	External Organs: Ratio
1874–1880	52.2	100.0	21.2	100.0
1881–1887	53.1	101.7	21.8	102.8
1888–1894	67.0	128.4	35.2	166.0

Source: The Causes of Death among the Assured in The Scottish Widows' Fund and Life Assurance Society from 1874 to 1894, inclusive. Edinburgh, 1902.

*Rectum is included in external organs.

Table 63
Mortality Experience of British and German Life Insurance Companies
Proportionate Mortality from Cancer
Up to 1860

	Cancer Per Cent.
Gotha Life Insurance	2.83
Scottish Amicable	1.81
Scottish Widows' Fund	1.69
Standard	2.07
North British	1.91
London Equitable	1.05
England and Wales, 1848–1854	2.61

Source: Aus der Praxis der Gothaer Lebensversicherungs-Bank. Jena, 1902.

Table 64
Mortality Experience of German Life Insurance Companies
Mortality from Cancer, 1899-1912

Year	Number of Companies	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
1899	4	5,530	645	11.7
1900	5	6,607	735	11.1
1901	7	8,532	933	10.9
1902	7	8,543	1,006	11.8
1903	6	5,627	608	10.8
1904	8	6,393	696	10.9
1905	9	7,844	837	10.7
1906	10	7,587	883	11.6
1907	11	7,765	865	11.1
1908	11	8,368	815	9.7
1909	11	8,473	897	10.6
1910	12	10,378	1,106	10.7
1911	12	10,892	1,165	10.7
1912	11	9,439	999	10.6
1899–1912	..	111,978	12,190	10.9

Source: Annual Reports of the several companies.

APPENDIX D

Table 65

Mortality Experience of the Life Insurance Company of the "Deutscher Kriegerbund" (German Veteran Society), Berlin, Germany

Mortality from Cancer

1908-1911

Year	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
1908	1,439	123	8.5
1909	1,579	156	9.9
1910	1,671	152	9.1
1911	1,824	194	10.6
1908–1911	6,513	625	9.6

Mortality from Cancer, by Organs and Parts

1908-1911

Organ	Deaths from Cancer	Cancer Per Cent.
Stomach, liver and abdomen	333	5.1
Other organs	292	4.5
All organs	625	9.6

Source: Annual Reports of Die Lebensversicherungs-Anstalt und Sterbekasse des Deutschen Kriegerbundes, Berlin.

Table 66

Mortality Experience of the German Life Insurance Company Potsdam, Germany

Mortality from Cancer, by Age

1907-1912

Ages	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
30 and under	80	3	3.8
31–40	354	17	4.8
41–50	633	74	11.7
51–60	914	125	13.7
61–70	1,181	199	16.9
71 and over	930	92	9.9
Total	4,092	510	12.5

Source: Annual Reports of Die Deutsche Lebensversicherung, Potsdam.

Table 67

Mortality Experience of the Bremen-Hanoveranian Life Insurance Company "Freia," Hanover, Germany

Mortality from Cancer, by Age

1907-1913

Ages	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
30 and under	158	2	1.3
31–60	2,112	183	8.7
61–70	926	140	15.1
71 and over	785	62	7.9
Total	3,981	387	9.7

Source: Annual Reports of "Freia," Bremen-Hannoversche Lebensversicherungs-Bank, Hanover.

APPENDIX D

Table 68

Ordinary Mortality Experience of the "Friedrich Wilhelm" Life Insuranc Company, Germany

Mortality from Cancer, 1885-1913

Year	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
1885	426	36	8.5
1886	434	35	8.1
1887	497	59	11.9
1888	492	54	11.0
1889	508	73	14.4
1890	507	50	9.9
1891	329	33	10.0
1892	338	27	8.0
1893	385	31	8.1
1894	355	43	12.1
1885–1894	4,271	441	10.3
1895	382	41	10.7
1896	368	39	10.6
1897	410	48	11.7
1898	395	42	10.6
1899	463	54	11.7
1900	431	49	11.4
1901	508	60	11.8
1902	533	56	10.5
1903	556	72	12.9
1904	540	59	10.9
1895–1904	4,586	520	11.3
1905	516	55	10.7
1906	567	65	11.5
1907	604	69	11.4
1908	,640	53	8.3
1909	666	69	10.4
1910	675	71	10.5
1911	750	71	9.5
1912	862	88	10.2
1913	848	93	11.0
1905–1913	6,128	634	10.3

Source: Zeitschrift für Krebsforschung, Vol. III. Friedrich Wilhelm Lebensversicherungs-Actiengesellschaft in Berlin. Geschäftsbericht.

Table 69

ry Mortality Experience of the "Friedrich Wilhelm" Life Insurance Company, Germany

Mortality from Cancer, by Organs and Parts, according to Sex

1885-1899

	MALES		FEMALES	
?art	Deaths from Cancer	Per Cent.	Deaths from Cancer	Per Cent.
....	..	..	..	..
....	..	..	..	..
....	10	2.1	..	..
gus.....................	48	9.9	3	1.6
....	216	44.6	56	30.9
s.....................	59	12.2	10	5.5
....	65	13.4	24	13.3
....	16	3.3	1	0.6
....	4	0.8	..	..
....	3	0.6	8	4.4
....	7	1.5	1	0.6
....	3	0.6	..	..
....	3	0.6	2	1.1
....	..	..	63	34.8
....	10	2.1	1	0.6
gans....................	40	8.3	12	6.6
ıs.....................	484	100.0	181	100.0

ce: Zeitschrift für Krebsforschung, Vol. III.

Table 70

ry Mortality Experience of the "Friedrich Wilhelm" Life Insurance Company, Germany

Mortality from Cancer, by Age and Sex

1885-1899

	MALES		FEMALES	
	Deaths from Cancer	Per Cent.	Deaths from Cancer	Per Cent.
....	4	0.8	1	0.6
....	24	5.0	11	6.1
....	104	21.5	46	25.4
....	170	35.1	69	38.1
....	143	29.5	38	21.0
....	38	7.9	16	8.8
ver....................	1	0.2	..	..
al.....................	484	100.0	181	100.0

ce: Zeitschrift für Krebsforschung, Vol III.

APPENDIX D

Table 71
Industrial Mortality Experience of the "Friedrich Wilhelm" Life Insurance Company, Germany
Mortality from Cancer, by Sex
1885-1899

	MALES			FEMALES		
Year	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
1885..................	326	12	3.7	325	37	11.4
1886..................	520	23	4.4	400	38	9.5
1887..................	553	22	4.0	491	58	11.8
1888..................	431	38	8.8	438	50	11.4
1889..................	833	55	6.6	802	98	12.2
1885–1889............	2,663	150	5.6	2,456	281	11.4
1890..................	1,062	64	6.0	980	111	11.3
1891..................	1,309	100	7.6	1,307	174	13.3
1892..................	1,441	110	7.6	1,603	207	12.9
1893..................	1,826	113	6.2	1,864	210	11.3
1894..................	2,180	182	8.3	2,192	289	13.2
1890–1894............	7,818	569	7.3	7,946	991	12.5
1895..................	2,721	229	8.4	2,644	344	13.0
1896..................	3,287	299	9.1	3,285	434	13.2
1897..................	3,930	349	8.9	3,770	543	14.4
1898..................	4,712	409	8.7	4,634	624	13.5
1899..................	5,952	475	8.0	5,827	719	12.3
1895–1899............	20,602	1,761	8.5	20,160	2,664	13.2

Source: *Zeitschrift für Krebsforschung*, Vol. III.

APPENDIX D

Table 72

rial Mortality Experience of the "Friedrich Wilhelm" Life Insurance Company, Germany

Mortality from Cancer, by Organs and Parts, according to Sex

1885-1899

	MALES		FEMALES	
?art	Deaths from Cancer	Per Cent.	Deaths from Cancer	Per Cent.
....	5	0.2	1	0.0
....	2	0.1	2	0.1
....	23	0.9	2	0.1
gus....................	267	10.8	68	1.7
ı........................	1,580	63.7	1,503	38.2
es......................	120	4.8	161	4.1
....	222	9.0	413	10.5
....	27	1.1	17	0.4
....	12	0.5	9	0.2
....	7	0.3	205	5.2
....	36	1.4	24	0.6
'......................	3	0.1	..	..
....	4	0.2	9	0.2
....	..	..	1,287	32.7
....	15	0.6	20	0.5
gans..................	157	6.3	215	5.5
ıs......................	2,480	100.0	3,936	100.0

ce: Zeitschrift für Krebsforschung, Vol. III.

Table 73

:ial Mortality Experience of the "Friedrich Wilhelm" Life Insurance Company, Germany

Mortality from Cancer, by Age and Sex

1885-1899

	MALES		FEMALES	
	Deaths from Cancer	Per Cent.	Deaths from Cancer	Per Cent.
....	6	0.2	15	0.4
....	70	2.8	166	4.2
....	390	15.7	746	18.9
....	1,140	46.0	1,755	44.6
....	821	33.1	1,154	29.3
....	52	2.1	98	2.5
ver....................	1	0.1	2	0.1
al......................	2,480	100.0	3,936	100.0

:e: Zeitschrift für Krebsforschung, Vol. III.

APPENDIX D

Table 74

Mortality Experience of the German Life Insurance Company, Lübeck
Mortality from Cancer, by Sex
1906-1913

Year	MALES Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.	FEMALES Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
1906	790	97	12.3	79	12	15.2
1907	770	84	10.9	88	7	8.0
1908	768	72	9.4	101	13	12.9
1909	755	87	11.5	89	12	13.5
1910	726	93	12.8	82	10	12.2
1911	728	91	12.5	83	11	13.3
1912	768	79	10.3	91	16	17.6
1913	724	94	13.0	87	13	14.9
1906–1913	6,029	697	11.6	700	94	13.4

Source: Annual Reports of Die Deutsche Lebensversicherungs-Gesellschaft, Lübeck.

Table 75

Mortality Experience of the "Germania" Life Insurance Company, Germany
Mortality from Cancer, by Age and Sex
1857-1894

Ages	Number of Lives Exposed to Risk One Year	Deaths from Cancer and Tumor	Rate per 100,000 Exposed
MALES			
Under 26	41,661.5	1	2.4
26–30	178,126.0	11	6.2
31–35	315,234.5	50	15.9
36–40	361,870.5	120	33.2
41–45	340,411.0	227	66.7
46–50	284,106.5	399	140.4
51–55	213,976.5	484	226.2
56–60	141,419.5	498	352.1
61–65	79,587.5	449	564.2
66–70	37,493.5	297	792.1
71 and over	18,529.5	147	793.3
Total	2,012,416.5	2,683	133.3
FEMALES			
Under 26	29,502.5	2	6.8
26–30	74,549.5	13	17.4
31–35	109,396.0	33	30.2
36–40	119,658.0	83	69.4
41–45	115,751.5	196	169.3
46–50	102,250.5	245	239.6
51–55	81,023.5	245	302.4
56–60	55,916.0	235	420.3
61–65	33,335.0	192	576.0
66–70	17,138.5	95	554.3
71 and over	10,638.0	85	799.0
Total	749,159.0	1,424	190.1

Source: Untersuchungen über die Sterblichkeit unter den Versicherten der "Germania," Lebensversicherungs-Aktien-Gesellschaft zu Stettin. Berlin, 1897.

APPENDIX D

Table 76
Mortality Experience of the Gotha Life Insurance Company, Germany
Mortality from Cancer by Age, Males
1829-1878

Ages	Number of Lives Exposed to Risk	Deaths from Cancer	Rate per 100,000 Exposed
15–20	714.5	..	..
21–25	7,174.0	..	..
26–30	40,574.0	2	4.9
31–35	97,948.5	11	11.2
36–40	141,078.5	40	28.4
41–45	156,854.0	80	51.0
46–50	148,165.0	141	95.2
51–55	128,034.5	168	131.2
56–60	99,884.0	226	226.3
61–65	69,231.0	271	391.4
66–70	42,108.5	207	491.6
71–75	21,253.5	122	574.0
76–80	8,288.0	41	494.7
81–85	2,339.5	13	555.7
86–90	325.5	..	..
Total	963,973.0	1,322	137.1

Source: Aus der Praxis der Gothaer Lebensversicherungsbank. Jena, 1902.

Table 77
Mortality Experience of the Gotha Life Insurance Company, Germany
Mortality from Cancer, by Age and Duration of Insurance, Males
1829-1896

Ages	1st to 5th Insurance Years: Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.	6th and Subsequent Years: Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
15–25	127	..	..	19	..	..
26–30	403	1	0.2	88	..	..
31–35	767	9	1.2	506	8	1.6
36–40	867	22	2.5	1,350	58	4.3
41–45	755	44	5.8	2,429	135	5.6
46–50	599	31	5.2	3,422	274	8.0
51–55	495	29	5.9	4,452	397	8.9
56–60	382	35	9.2	5,361	537	10.0
61–65	157	15	9.6	5,836	634	10.9
66–70	29	3	10.3	5,750	541	9.6
71–75	1	..	..	4,679	385	8.2
76–80	..	..	..	3,082	150	4.9
81–85	..	..	..	1,442	53	3.7
86–90	..	..	..	382	7	1.8
Total	4,582	189	4.1	38,798	3,179	8.2

Source: Aus der Praxis der Gothaer Lebensversicherungsbank. Jena, 1902.

APPENDIX D

Table 78

Mortality Experience of the Gotha Life Insurance Company, Germany
Mortality from Cancer, by Age
1903-1912

Ages	1903-1907 Deaths from All Causes	1903-1907 Deaths from Cancer	1903-1907 Cancer Per Cent.	1908-1912 Deaths from All Causes	1908-1912 Deaths from Cancer	1908-1912 Cancer Per Cent.
15–30................	142	6	4.2	165	6	3.6
31–35................	209	6	2.9	247	10	4.0
36–40................	344	26	7.6	361	22	6.1
41–45................	523	51	9.8	525	56	10.7
46–50................	741	92	12.4	773	92	11.9
51–55................	895	143	16.0	1,031	168	16.3
56–60................	1,175	182	15.5	1,153	190	16.5
61–65................	1,321	206	15.6	1,330	216	16.2
66–70................	1,445	230	15.9	1,439	236	16.4
71–75................	1,175	145	12.3	1,359	172	12.7
76–80................	967	98	10.1	1,074	94	8.8
81–85................	565	28	5.0	635	29	4.6
86–90................	201	5	2.5	235	9	3.8
Total............	9,703	1,218	12.6	10,327	1,300	12.6

Ages	1903-1912 Deaths from All Causes	1903-1912 Deaths from Cancer	1903-1912 Cancer Per Cent.
15–30................	307	12	3.9
31–35................	456	16	3.5
36–40................	705	48	6.8
41–45................	1,048	107	10.2
46–50................	1,514	184	12.2
51–55................	1,926	311	16.1
56–60................	2,328	372	16.0
61–65................	2,651	422	15.9
66–70................	2,884	466	16.2
71–75................	2,534	317	12.5
76–80................	2,041	192	9.4
81–85................	1,200	57	4.8
86–90................	436	14	3.2
Total............	20,030	2,518	12.6

Source: Original data furnished by the Gothaer Lebensversicherungsbank, Gotha.

APPENDIX D

Table 79

Mortality Experience of the Gotha Life Insurance Company, Germany
Mortality from Cancer among Teachers
1829-1890

	Number of Lives Exposed to Risk	Deaths from Cancer	Rate per 100,000 Exposed
chool-teachers			
ges 21–45	82,213.0	22	26.8
46–60	54,770.5	93	169.8
61–90	22,885.0	112	489.4
ll ages	159,868.5	227	142.0
ligh-school Teachers			
ges 26–45	32,247.0	13	40.3
46–60	20,687.0	31	149.9
61–90	9,014.5	39	432.6
ll ages	61,948.5	83	134.0
Iniversity Professors	7,814.5	10	128.0
'rofessors of Medicine	2,792.0	5	179.1

Source: Aus der Praxis der Gothaer Lebensversicherungsbank. Jena, 1902.

Table 80

Mortality Experience of the Karlsruhe Life Insurance Company, Germany
Mortality from Cancer
1910-1913

Year	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
1910	1,436	169	11.8
1911	1,554	195	12.5
1912	1,535	230	15.0
1913	1,564	256	16.4
1910–1913	6,089	850	14.0

Source: Correspondence from Karlsruher Lebensversicherung, Karlsruhe.

APPENDIX D

Table 81

Mortality Experience of the Karlsruhe Life Insurance Company, Germany
Mortality from Cancer, by Organs and Parts, according to Age
1910-1913

Organ or Part	Under 30	31-40	41-50	51-60	61-70	71 and Over	All Ages	Per Cent. of All Organs
Tongue...........	..	..	3	2	..	3	8	0.9
Larynx...........	..	..	3	6	5	2	16	1.9
Œsophagus and stomach........	2	22	76	144	117	38	399	46.9
Intestines.........	..	10	21	60	51	25	167	19.7
Liver.............	..	5	10	26	26	10	77	9.1
Breast...........	..	..	2	4	2	..	8	0.9
Uterus...........	..	..	..	4	2	2	8	0.9
Other organs.....	1	8	25	54	49	30	167	19.7
All organs........	3	45	140	300	252	110	850	..
Per cent. of all ages.	0.4	5.3	16.5	35.3	29.6	12.9	..	100.0

Source: Original data furnished by the Karlsruher Lebensversicherung, Karlsruhe.

Table 82

Mortality Experience of the Karlsruhe Life Insurance Company, Germany
Mortality from Cancer, by Organs and Parts
1900-1905

Organ or Part	Deaths from Cancer	Per Cent.
Tongue....................	12	1.7
Larynx....................	17	2.3
Œsophagus and stomach.....	347	48.0
Intestines..................	134	18.5
Liver......................	93	12.9
Breast.....................	8	1.1
Uterus.....................	20	2.8
Other organs................	92	12.7
All organs..................	723	100.0

Source: Annual Reports of Karlsruher Lebensversicherung, Karlsruhe.

Table 83

lity Experience of the Karlsruhe Life Insurance Company, Germany
Mortality from Cancer, by Age, 1900-1905

Ages	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
20 and under.	5	..	..
21–25.......	67	2	3.0
26–30.......	223	2	0.9
31–35.......	368	10	2.7
36–40.......	569	26	4.6
41–45.......	784	59	7.5
46–50.......	915	109	11.9
51–55.......	1,040	146	14.0
56–60.......	1,008	155	15.4
61–65.......	776	109	14.0
66–70.......	537	60	11.2
71–75.......	329	31	9.4
76–80.......	127	12	9.4
Above 80....	42	2	4.8
Total.....	6,790	723	10.6

Source: Annual Reports of the Karlsruher Lebensversicherung, Karlsruhe.

Table 84

ality Experience of the Leipzig Life Insurance Company, Germany
Mortality from Cancer, by Sex, 1893-1913

	MALES			FEMALES		
	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
....	752	86	11.4	46	5	10.9
....	743	75	10.1	40	5	12.5
....	785	83	10.6	60	7	11.7
....	829	91	11.0	34	5	14.7
....	797	96	12.0	38	4	10.5
....	847	94	11.1	60	10	16.7
....	869	100	11.5	42	5	11.9
....	936	111	11.9	34	3	8.8
....	927	126	13.6	43	6	14.0
....	1,016	137	13.5	43	8	18.6
....	1,062	132	12.4	55	14	25.5
....	1,043	142	13.6	47	3	6.4
....	1,115	117	10.5	52	8	15.4
....	1,120	141	12.6	39	5	12.8
....	1,196	169	14.1	36	5	13.9
....	1,213	151	12.4	47	6	12.8
....	1,189	148	12.4	43	6	14.0
....	1,253	159	12.7	41	2	4.9
....	1,277	158	12.4	41	4	9.8
....	1,263	163	12.9	47	7	14.9
....	1,302	168	12.9	34	5	14.7
03............	9,563	1,131	11.8	495	72	14.5
13............	11,971	1,516	12.7	427	51	11.9

rce: Annual Reports of the Leipziger Lebensversicherungs-Gesellschaft, Leipzig.

APPENDIX D

Table 85
Mortality Experience of the Leipzig Life Insurance Company, Germany
Mortality from Cancer, according to Age, Males
1893-1912

Ages	1893-1902 Deaths from All Causes	1893-1902 Deaths from Cancer	1893-1902 Cancer Per Cent.	1903-1912 Deaths from All Causes	1903-1912 Deaths from Cancer	1903-1912 Cancer Per Cent.
15–30	174	7	4.0	272	6	2.2
31–40	817	42	5.1	986	66	6.7
41–50	1,766	180	10.2	2,152	223	10.4
51–60	2,458	352	14.3	3,110	486	15.6
61–70	2,018	288	14.3	2,958	473	16.0
71–85	1,268	130	10.3	2,253	226	10.0
Total	8,501	999	11.8	11,731	1,480	12.6

Source: Annual Reports of the Leipziger Lebensversicherungs-Gesellschaft, Leipzig.

Table 86
Mortality Experience of the Magdeburg Life Insurance Company Germany
Mortality from Cancer
1901-1913

Year	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
1901	736	57	7.7
1902	740	64	8.6
1903	807	78	9.7
1904	699	59	8.4
1905	750	76	10.1
1906	703	82	11.7
1907	762	91	11.9
1908	803	69	8.6
1909	742	72	9.7
1910	815	92	11.3
1911	890	93	10.4
1912	885	94	10.6
1913	883	112	12.7
1901–1913	10,215	1,039	10.2

Source: Annual Reports of the Magdeburger Lebensversicherungs-Gesellschaft, Magdeburg.

Table 87
Mortality Experience of the Magdeburg Life Insurance Company Germany
Mortality from Cancer, by Age
1901-1913

Ages	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
Under 30	247	1	0.4
30–39	1,199	52	4.3
40–49	2,010	160	8.0
50–59	2,241	292	13.0
60–69	2,117	323	15.3
70 and over	2,401	211	8.8
Total	10,215	1,039	10.2

Source: Annual Reports of the Magdeburger Lebensversicherungs-Gesellschaft, Magdeburg.

APPENDIX D

Table 88

Mortality Experience of the Saxon Military Life Insurance Society Dresden, Germany

Mortality from Cancer, by Organs and Parts, according to Sex 1903-1906

Organ or Part	MALES Deaths from Cancer	MALES Per Cent.	FEMALES Deaths from Cancer	FEMALES Per Cent.
Tongue	4	3.2	..	..
Larynx	2	1.6	..	..
Œsophagus	8	6.3	2	1.9
Stomach	64	50.8	47	45.2
Liver	13	10.3	7	6.7
Intestines	16	12.7	5	4.8
Kidney and bladder	5	4.0	..	..
Lungs	5	4.0	1	1.0
Breast	..	..	4	3.8
Uterus and ovary	..	..	28	26.9
Other organs	9	7.1	10	9.7
All organs	126	100.0	104	100.0

MORTALITY FROM CANCER, BY SEX, 1903-1906

	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
Males	1,545	126	8.2
Females	874	104	11.9
Total	2,419	230	9.5

Source: Annual Reports of Sächsischer Militär Lebensversicherungs-Verein, Dresden.

Table 89

Mortality Experience of the Stuttgart Life Insurance Company Germany

Mortality from Cancer, by Age 1901-1906

Ages	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
Under 30	215	4	1.9
30–34	259	11	4.2
35–39	432	28	6.5
40–44	560	43	7.7
45–49	715	90	12.6
50–54	833	99	11.9
55–59	890	143	16.1
60–64	879	141	16.0
65–69	742	105	14.2
70–74	675	96	14.2
75–79	426	32	7.5
80–89	327	25	7.6
Total	6,953	817	11.8

Source: Annual Reports of the Stuttgarter Lebensversicherungsbank, Stuttgart.

Table 90

Mortality Experience of the "Teutonia" Life Insurance Company Germany

Mortality from Cancer, by Age 1905-1912

Ages	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
20–30	165	1	0.6
31–40	681	39	5.7
41–50	1,234	126	10.2
51–60	1,760	245	13.9
61–70	2,602	428	16.4
71–80	2,503	298	11.9
81 and over	835	29	3.5
Total	9,780	1,166	11.9

Source: Annual Reports of the Teutonia Versicherungs-Actien-Gesellschaft, Leipzig.

APPENDIX D

Table 91

Mortality Experience of the "Victoria" Life Insurance Company, Berlin
Mortality from Cancer, 1903-1913

Year	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
1903........	861	73	8.5
1904........	1,014	87	8.6
1905........	1,103	91	8.3
1906........	1,218	104	8.5
1907........	1,247	101	8.1
1908........	1,434	121	8.4
1909........	1,522	127	8.3
1910........	1,515	142	9.4
1911........	1,783	153	8.6
1912........	1,890	180	9.5
1913........	2,146	206	9.6
1903–1913...	15,733	1,385	8.8

Source: Annual Reports of the "Victoria zu Berlin," Berlin.

Table 92

Mortality Experience of Austrian Life Insurance Companies
Mortality from Cancer, 1899-1912

Year	Number of Companies	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
1899...........................	2	1,495	129	8.6
1900...........................	4	3,048	316	10.4
1901...........................	6	4,499	398	8.8
1902...........................	6	4,401	396	9.0
1903...........................	5	3,755	413	11.0
1904...........................	7	4,553	455	10.0
1905...........................	8	5,481	479	8.7
1906...........................	9	5,467	550	10.1
1907...........................	12	7,820	736	9.4
1908...........................	12	8,362	767	9.2
1909...........................	13	9,371	827	8.8
1910...........................	13	9,294	871	9.4
1911...........................	13	9,795	920	9.4
1912...........................	13	9,979	977	9.8
1899–1912......................	..	87,320	8,234	9.4

Source: Annual Reports of the several companies.

APPENDIX D

Table 93

Mortality Experience of Austrian Life Insurance Companies
Mortality from Cancer, by Age
1899-1912

Ages	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
Under 31....	4,498	67	1.5
31–35.......	4,802	156	3.2
36–40.......	6,933	348	5.0
41–45.......	8,703	582	6.7
46–50.......	9,875	1,015	10.3
51–55.......	10,107	1,233	12.2
56–60.......	10,218	1,387	13.6
61–65.......	9,352	1,326	14.2
66–70.......	7,988	1,041	13.0
71–75.......	6,478	640	9.9
76–80.......	4,840	328	6.8
81–85.......	2,759	98	3.6
86 and over...	767	13	1.7
Total......	87,320	8,234	9.4

Source: Annual Reports of the several companies.

Table 94

Mortality Experience of Austrian Life Insurance Companies
Mortality from Cancer, according to Age
1876-1890 Compared with 1891-1900

	1876-1890			1891-1900		
	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
....	473	2	0.4	580	8	1.4
....	1,103	27	2.4	1,299	38	2.9
....	1,802	89	4.9	2,244	94	4.2
....	2,481	146	5.9	3,094	193	6.2
....	2,907	247	8.5	3,722	365	9.8
....	3,235	274	8.5	3,852	456	11.8
....	3,536	365	10.3	3,883	482	12.4
....	3,410	316	9.3	3,255	417	12.8
....	3,009	258	8.6	3,132	395	12.6
....	1,669	164	9.8	2,006	215	10.7
....	1,070	45	4.2	1,684	112	6.7
....	425	6	1.4	789	33	4.2
....	75	2	2.7	150	2	1.3
....	25,195	1,941	7.7	29,690	2,810	9.5

Versicherungswissenschaftliche Mitteilungen, IX. Band, 1. Heft. Vienna, 1914.

APPENDIX D

Table 95
Mortality Experience of Austrian Life Insurance Companies, 1876-1900
Probability of Death from Cancer Multiplied by 100,000

Ages	1876–1880	1881–1885	1886–1890	1891–1895	1896–1900
17–29	..	..	5.33	12.18	2.04
30–34	20.37	24.15	14.36	19.92	11.39
35–39	56.28	50.09	38.56	39.84	21.25
40–44	78.70	95.47	55.95	69.86	50.03
45–49	152.27	166.03	126.86	160.97	107.22
50–54	243.81	171.47	206.42	262.79	189.57
55–59	298.82	334.19	362.41	368.29	327.43
60–64	346.91	395.76	455.04	519.90	446.88
65–69	553.88	503.06	576.39	804.91	668.88
70–74	999.48	940.54	824.59	818.44	886.88
75–79	64.02	654.35	623.06	608.54	934.40
80–84	..	511.04	169.96	807.13	694.01
85–98	..	..	1284.16*	..	435.96

Source: Versicherungswissenschaftliche Mitteilungen, IX. Band, 1. Heft. Vienna, 1914.
*Based on only two deaths.

Table 96
Mortality Experience of "Der Anker" Life Insurance Company Vienna, Austria
Mortality from Cancer, by Age
1901-1913

Ages	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
30 and under	1,034	22	2.1
31–35	415	13	3.1
36–40	581	17	2.9
41–45	782	40	5.1
46–50	871	65	7.5
51–55	914	89	9.7
56–60	775	80	10.3
61–65	690	78	11.3
66–70	603	70	11.6
71–75	612	24	3.9
76–80	428	12	2.8
81–85	302	4	1.3
86 and over	151	..	..
Total	8,158	514	6.3

Source: Annual Reports of the Life Insurance Company "Der Anker," Vienna.
Note: 1903 is missing.

Table 97
Mortality Experience of the "Assicurazioni Generali," Trieste, Austria
Mortality from Cancer
1899-1912

Year	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
1899	943	77	8.2
1900	895	90	10.1
1901	947	92	9.7
1902	1,035	97	9.4
1903	1,063	93	8.7
1904	1,016	94	9.3
1905	1,145	107	9.3
1906	1,075	101	9.4
1907	1,192	137	11.5
1908	1,209	120	9.9
1909	1,292	114	8.8
1910	1,238	123	9.9
1911	1,295	102	7.9
1912	1,277	114	8.9
Total	15,622	1,461	9.4

Source: Annual Reports of the "Assicurazioni Generali," Trieste.

Table 98

Mortality Experience of the "Assicurazioni Generali," Trieste, Austria

Mortality from Cancer, by Age

1899-1912

Ages	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
30 and under	579	13	2.2
31–35	836	36	4.3
36–40	1,270	63	5.0
41–45	1,660	115	6.9
46–50	1,850	194	10.5
51–55	1,782	213	12.0
56–60	1,672	233	13.9
61–65	1,408	192	13.6
66–70	1,337	159	11.9
71–75	1,303	121	9.3
76–80	1,150	86	7.5
81–85	692	32	4.6
86 and over	83	4	4.8
Total	15,622	1,461	9.4

Source: Annual Reports of the "Assicurazioni Generali," Trieste.

Table 99

Mortality Experience of the Life Insurance Company "Donau," Vienna, Austria

Mortality from Cancer, by Age

1908-1912

Ages	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
30 and under	72	1	1.4
31–35	117	6	5.1
36–40	156	7	4.5
41–45	175	10	5.7
46–50	250	22	8.8
51–55	248	34	13.7
56–60	272	40	14.7
61–65	261	45	17.2
66–70	214	27	12.6
71–75	172	25	14.5
76–80	136	10	7.4
81 and over	91	..	..
Total	2,164	227	10.5

Source: Annual Reports of the Life Insurance Company "Donau," Vienna.

Table 100

Mortality Experience of the First General Association of Austro-Hungarian Officials Vienna, Austria

Mortality from Cancer, by Age

1900-1912

Ages	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
30 and under	279	3	1.1
31–35	581	12	2.1
36–40	939	37	3.9
41–45	1,283	86	6.7
46–50	1,649	182	11.0
51–55	2,104	267	12.7
56–60	2,559	380	14.8
61–65	2,569	391	15.2
66–70	2,259	328	14.5
71–75	1,668	203	12.2
76–80	1,085	85	7.8
81–85	532	26	4.9
86 and over	..	..	..
Total	17,507	2,000	11.4

Source: Annual Reports of Erster Allgemeiner Beamten-Verein der Österreichisch-Ungarischen Monarchie, Wien.

Table 101

Mortality Experience of the Mutual Life Insurance Company "Janus," Vienna, Austria

Mortality from Cancer, by Age

1907-1912

Ages	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
30 and under	125	4	3.2
31–35	216	9	4.2
36–40	255	17	6.7
41–45	331	30	9.1
46–50	364	46	12.6
51–55	387	57	14.7
56–60	388	59	15.2
61–65	346	44	12.7
66–70	350	45	12.9
71–75	330	25	7.6
76–80	284	22	7.7
81–85	162	8	4.9
86 and over	140	4	2.9
Total	3,678	370	10.1

Source: Annual Reports of the Mutual Life Insurance Company "Janus," Vienna.

Table 102

Mortality Experience of the Life Insurance Company of the "Margraviate Moravia," Brünn, Austria

Mortality from Cancer, by Age

1906-1912

Ages	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
30 and under.	195	2	1.0
31–35.......	183	2	1.1
36–40.......	269	12	4.5
41–45.......	238	19	8.0
46–50.......	228	20	8.8
51–55.......	159	25	15.7
56–60.......	117	12	10.3
61–65.......	54	8	14.8
66–70.......	21	4	19.0
71 and over...	2	..	..
Total......	1,466	104	7.1

Source: Annual Reports of the Landes-Lebensversicherungs-Anstalt der Markgrafschaft Mähren, Brünn.

Table 103

Mortality Experience of the Mutual Life Insurance Company of Krakau, Austria

Mortality from Cancer, by Age

1905-1912

Ages	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
30 and under.	82	3	3.7
31–35.......	197	6	3.0
36–40.......	420	20	4.8
41–45.......	570	40	7.0
46–50.......	597	46	7.7
51–55.......	604	52	8.6
56–60.......	524	68	13.0
61–65.......	507	76	15.0
66–70.......	324	40	12.4
71–75.......	184	26	14.1
76–80.......	118	8	6.8
81 and over...	47	..	..
Total......	4,174	385	9.2

Source: Annual Reports of the Krakau Mutual Life Insurance Company, Krakau.

Table 104

Mortality Experience of the "Phoenix" Life Insurance Company Vienna, Austria

Mortality from Cancer

1901-1913

Year	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
1901........	729	38	5.2
1902........	785	56	7.1
1903........	774	87	11.2
1904........	790	73	9.2
1905........	915	73	8.0
1906........	873	85	9.7
1907........	929	100	10.8
1908........	963	110	11.4
1909........	1,016	102	10.0
1910........	1,001	84	8.4
1911........	954	93	9.7
1912........	895	107	12.0
1913........	847	80	9.4
Total......	11,471	1,088	9.5

Source: Annual Reports of the Österreichischer Phœnix, Vienna.

Table 105

Mortality Experience of the "Phoenix" Life Insurance Company Vienna, Austria

Mortality from Cancer, by Age

1901-1912

	1901-1906			1907-1912		
	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
nder..........	142	2	1.4	160	2	1.3
....	237	2	0.8	262	9	3.4
....	312	14	4.5	402	30	7.5
....	408	22	5.4	462	24	5.2
....	517	51	9.9	581	57	9.8
....	538	57	10.6	555	76	13.7
....	604	67	11.1	659	82	12.4
....	625	81	13.0	714	105	14.7
....	552	52	9.4	718	111	15.5
....	428	45	10.5	570	65	11.4
....	312	16	5.1	382	26	6.8
....	141	3	2.1	217	8	3.7
ver...........	50	..	..	76	1	1.3
Total..........	4,866	412	8.5	5,758	596	10.4

ce: Annual Reports of the Österreichischer Phœnix, Vienna.

Table 106

ity Experience of the "Praha" al Life Insurance Company Prague, Austria

tality from Cancer, by Age

1900-1907

es	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
nder.	97	1	1.0
.....	123	5	4.1
.....	140	7	5.0
.....	170	9	5.3
.....	185	26	14.1
.....	156	26	16.7
.....	145	20	13.8
.....	157	21	13.4
.....	135	16	11.9
.....	79	3	3.8
.....	30	4	13.3
.....	7	..	..
ver...	..	..	..
.....	1,424	138	9.7

: Annual Reports of the Mutual rance Company "Praha," Prague,

Table 107

Mortality Experience of the "Riunione Adriatica Sicurta" Life Insurance Company, Trieste, Austria

Mortality from Cancer, by Age

1899-1912

Ages	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
30 and under.	305	6	2.0
31–35.......	495	15	3.0
36–40.......	721	42	5.8
41–45.......	1,040	73	7.0
46–50.......	1,142	120	10.5
51–55.......	1,165	123	10.6
56–60.......	1,113	130	11.7
61–65.......	904	100	11.1
66–70.......	786	94	12.0
71–75.......	694	59	8.5
76–80.......	586	36	6.1
81–85.......	372	11	3.0
86 and over...	131	2	1.5
Total......	9,454	811	8.6

Source: Annual Reports of the "Riunione Adriatica Sicurta," Trieste.

Table 108

Mortality Experience of the Industrial Insurance Company "Universale," Vienna, Austria

Mortality from Cancer, by Age

1907-1912

Ages	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
30 and under.	1,084	6	0.6
31–35.......	680	23	3.4
36–40.......	819	45	5.5
41–45.......	902	60	6.7
46–50.......	949	102	10.7
51–55.......	947	140	14.8
56–60.......	914	146	16.0
61–65.......	820	134	16.3
66–70.......	520	73	14.0
71–75.......	345	37	10.7
76–80.......	290	16	5.5
81–85.......	216	6	2.8
86 and over...	108	2	1.9
Total......	8,594	790	9.2

Source: Annual Reports of the Industrial Life Insurance Company "Universale," Vienna.

Table 109

Mortality Experience of the "Foncière" Life Insurance Comp Budapest, Hungary

Mortality from Cancer, by Ag

1900-1912

Ages	Deaths from All Causes	Deaths from Cancer	Ca Per
30 and under.	134	2	
31–35.......	159	7	
36–40.......	311	12	
41–45.......	397	32	
46–50.......	476	34	
51–55.......	419	46	
56–60.......	420	48	
61–65.......	303	42	
66–70.......	246	17	
71–75.......	147	10	
76–80.......	69	3	
81–85.......	30	..	
86 and over...	6	..	
Total......	3,117	253	

Source: Annual Reports of the ' cière," Pester Versicherungs-Anstalt,] pest, Hungary.

Table 110

Mortality Experience of the "Basle" Life Insurance Company Switzerland, 1865-1897

MORTALITY FROM CANCER

Years	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
1865–1877...	1,482	103	6.95
1878–1887...	2,332	190	8.15
1888–1897...	3,252	347	10.67
1865–1897...	7,066	640	9.06

MORTALITY FROM CANCER, BY SEX

Males.......	5,755	500	8.69
Females.....	927	140	15.10

Source: 7066 Todesfälle der Basler Lebensversicherungs-Gesellschaft medizinish und statistisch bearbeitet von Dr. Arthur Hesse. Leipzig, 1899.

Table 111

Mortality Experience of "La Suisse" Life Insurance Com Lausanne, Switzerland

Mortality from Cancer, by A

1901-1913

Ages	Deaths from All Causes	Deaths from Cancer	C Pe
21–30.......	41	2	
31–40.......	162	7	
41–50.......	225	20	
51–60.......	269	39	
61–70.......	274	36	
71–80.......	225	22	
81–90.......	57	3	
Total......	1,253	129	

Source: Annual Reports of "La Sı Société d'Assurances sur la vie et c les accidents, Lausanne.

APPENDIX D

Table 112
Mortality Experience of the Life Insurance Company "Thule" Stockholm, Sweden
Mortality from Cancer and Other Tumors 1873-1902

Year	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
1873	1	..	..
1874	4	1	25.0
1875	12	..	..
1876	6	..	..
1877	12	..	..
1878	14	..	..
1879	11	3	27.3
1880	10	..	..
1881	18	1	5.6
1882	21	1	4.8
1873–1882	109	6	5.5
1883	24	2	8.3
1884	23	3	13.0
1885	42	3	7.1
1886	32	2	6.3
1887	33	1	3.0
1888	35	4	11.4
1889	40	4	10.0
1890	58	4	6.9
1891	70	3	4.3
1892	86	3	3.5
1883–1892	443	29	6.5
1893	103	9	8.7
1894	97	9	9.3
1895	92	10	10.9
1896	123	15	12.2
1897	152	17	11.2
1898	133	11	8.3
1899	151	15	9.9
1900	181	19	10.5
1901	236	25	10.6
1902	201	21	10.4
1893–1902	1,469	151	10.3

Source: Lifsförsäkringsaktiebolaget Thule, Stockholm, Trettio Års Verksamhet, 1873-1902.

APPENDIX D

Table 113
Mortality Experience of The Australian Mutual Provident Society
Mortality from Cancer, by Age and Sex
1849-1888

	MALES			FEMALES		
Ages	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
19–24	204	2	1.0	7	..	..
25–29	358	2	0.6	10	..	..
30–34	493	7	1.4	23	..	..
35–39	628	13	2.1	40	..	..
40–44	776	27	3.5	25	4	16.0
45–49	804	42	5.2	20	3	15.0
50–54	705	49	7.0	28	7	25.0
55–59	543	33	6.1	22	5	22.7
60–64	379	30	7.9	17	4	23.5
65–69	269	14	5.2	12	..	..
70–74	105	10	9.5	9	2	22.2
75–79	45	3	6.7	6	..	..
80 and over	16	..	..	2	..	..
Total	5,325	232	4.4	221	25	11.3

Source: Report on the Mortality Experience of The Australian Mutual Provident Society for the forty years 1849 to 1888.

Table 114
Mortality Experience of The Australian Mutual Provident Society
Mortality from Tumor, by Age and Sex
1849-1888

	MALES			FEMALES		
Ages	Deaths from All Causes	Deaths from Tumor	Tumor Per Cent.	Deaths from All Causes	Deaths from Tumor	Tumor Per Cent.
19–24	204	..	..	7	..	..
25–29	358	..	..	10	..	..
30–34	493	1	0.2	23	..	..
35–39	628	1	0.2	40	..	..
40–44	776	2	0.3	25	..	..
45–49	804	2	0.2	20	1	5.0
50–54	705	1	0.1	28	..	..
55–59	543	1	0.2	22	..	..
60–64	379	1	0.3	17	..	..
65–69	269	..	..	12	..	..
70–74	105	1	1.0	9	..	..
75–79	45	..	..	6	..	..
80 and over	16	..	..	2	..	..
Total	5,325	10	0.2	221	1	0.5

Source: Report on the Mortality Experience of The Australian Mutual Provident Society for the forty years 1849 to 1888.

Table 115

Mortality Experience of
)riental Government Security
Life Assurance Company
Bombay, British India

rtality from Cancer, by Race
1897-1913

	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
»s.....	7,281	70	0.96
›ans...	840	33	3.93
s......	637	12	1.88
nedans	259	1	0.39
ıl.....	9,017	116	1.29

ce: Annual Reports of The Oriental
ıment Security Life Assurance Com-
Limited.

Table 116

Mortality Experience of
The Dutch East Indian Life
Insurance Company
Batavia, Dutch East Indies

Mortality from Cancer, by Age
1911-1913

Ages	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
Under 40....	43	1	2.3
40–49.......	43	2	4.7
50–64.......	51	11	21.6
65 and over...	24	1	4.2
Total.....	161	15	9.3

Source: Annual Reports of the Nederlandsch-Indische Levensverzekeringen Lijfrente Maatschappij, Batavia, Dutch East Indies.

Table 117

ſortality Experience of the Meiji Life Assurance Company, Japan
Mortality from Cancer, by Sex
1899-1907

	MALES			FEMALES		
	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
....	417	33	7.9	91	9	9.9
....	443	32	7.2	95	11	11.6
....	505	39	7.7	104	13	12.5
....	618	62	10.0	180	18	10.0
....	615	64	10.4	160	24	15.0
....	787	56	7.1	180	31	17.2
....	851	90	10.6	210	20	9.5
....	743	70	9.4	238	27	11.3
....	940	83	8.8	296	27	9.1
907............	5,919	529	8.9	1,554	180	11.6

TOTAL

	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
1899–1907............	7,473	709	9.5

ırce: Mortality Experience in the Meiji Life Assurance Company, 1899 to 1907.

APPENDIX D

Table 118

Mortality Experience of the Meiji Life Assurance Company, Japan
Mortality from Carcinoma, by Age and Sex
1899-1907

Ages	Total: Number of Deaths	Total: Per Cent.	Males: Number of Deaths	Males: Per Cent.	Females: Number of Deaths	Females: Per Cent.
25–29	3	0.4	2	0.4	1	0.6
30–34	11	1.6	4	0.8	7	4.0
35–39	36	5.2	18	3.5	18	10.2
40–44	72	10.4	49	9.5	23	13.0
45–49	114	16.4	85	16.4	29	16.4
50–54	153	22.0	125	24.1	28	15.8
55–59	149	21.4	115	22.2	34	19.2
60–64	106	15.3	83	16.0	23	13.0
65–69	36	5.2	28	5.4	8	4.5
70–74	15	2.2	9	1.7	6	3.4
Total	695	100.0	518	100.0	177	100.0

Source: Mortality Experience in the Meiji Life Assurance Company, 1899 to 1907.

Table 119

Mortality Experience of the Meiji Life Assurance Company, Japan
Mortality from Cancer, by Organs and Parts, according to Sex
1899-1907

Carcinoma of	Total: Number of Deaths	Total: Per Cent.	Males: Number of Deaths	Males: Per Cent.	Females: Number of Deaths	Females: Per Cent.
Buccal cavity	16	2.3	16	3.0	..	..
Larynx	16	2.3	14	2.6	2	1.1
Œsophagus	88	12.4	85	16.1	3	1.7
Stomach	371	52.3	306	57.8	65	36.1
Liver	52	7.3	42	7.9	10	5.6
Intestines and peritoneum	44	6.2	33	6.2	11	6.1
Kidneys and urethra	7	1.0	6	1.1	1	0.6
Lungs and pleura	5	0.7	4	0.8	1	0.6
Uterus	79	11.1	..	..	79	43.9
Breast	4	0.6	..	..	4	2.2
Neck	6	0.8	6	1.1	..	..
Other organs	7	1.0	6	1.1	1	0.6
Sarcoma	14	2.0	11	2.1	3	1.7
All organs	709	100.0	529	100.0	180	100.0

Source: Mortality Experience in the Meiji Life Assurance Company, 1899 to 1907.

APPENDIX D

Table 120

tality Experience of Domestic Life Insurance Companies of Japan
Mortality from Cancer, by Organs and Parts
according to Age and Sex, 1910-1912

	Deaths from All Causes	MALES Cancer of Stomach Deaths	Per Cent. of All Causes	Cancer of Other Organs Deaths	Per Cent. of All Causes	Cancer of All Organs Deaths	Per Cent. of All Causes
nder	799	..	0.0	..	0.0	..	0.0
....	3,600	8	0.2	6	0.2	14	0.4
....	5,863	105	1.8	40	0.7	145	2.5
....	7,407	376	5.1	205	2.8	581	7.9
....	7,381	688	9.3	372	5.0	1,060	14.3
....	4,543	411	9.0	217	4.8	628	13.8
....	800	49	6.1	28	3.5	77	9.6
....	9	1	11.1	..	0.0	1	11.1
....	30,402	1,638	5.4	868	2.8	2,506	8.2
		FEMALES					
nder........	400	..	0.0	..	0.0	..	0.0
....	1,788	5	0.3	7	0.4	12	0.7
....	2,605	27	1.0	61	2.3	88	3.3
....	2,155	75	3.5	113	5.2	188	8.7
....	2,250	160	7.1	121	5.4	281	12.5
....	1,800	122	6.8	84	4.7	206	11.5
....	477	21	4.4	18	3.8	39	8.2
....	7	..	..	..	..	..	0.0
....	11,482	410	3.6	404	3.5	814	7.1

e: The Insurance Year Book, 1910-1912, Department of Agriculture and Com-
pan.

Table 121

ility Experience of Foreign Life Insurance Companies of Japan
Mortality from Cancer by Organs and Parts
according to Age, Males, 1912

	Deaths from All Causes	MALES Cancer of Stomach Deaths	Per Cent. of All Causes	Cancer of Other Organs Deaths	Per Cent. of All Causes	Cancer of All Organs Deaths	Per Cent. of All Causes
nder.......	5	..	..	..	..	..	..
....	13	..	..	..	..	..	..
....	62	..	..	..	..	..	..
....	103	2	1.9	4	3.9	6	5.8
....	79	8	10.1	11	13.9	19	24.0
....	28	3	10.7	5	17.9	8	28.6
....	290	13	4.5	20	6.9	33	11.4

e: The Insurance Year Book, 1912, Department of Agriculture and Commerce,

: There were no cases of cancer in the female experience.

APPENDIX

E

Cancer Mortality According to Latitude, Size of Cities, and Specified Organs and Parts Throughout the World

Table		Page
1	Mortality from Cancer in Large Cities, according to Latitude, 1908-1912......	403
2	Mortality from Cancer in Large Cities of the Eastern and Western Hemispheres, according to Latitude, 1908-1912...........................	407
3	Mortality from Cancer in Cities, according to Size, 1908-1912..............	410
4	Comparative Mortality from Cancer, by Organs and Parts, in Thirteen Principal Countries of the World..	413

APPENDIX E

Table 1

Mortality from Cancer in Large Cities, according to Latitude 1908-1912

MORE NORTHERLY THAN 50° N. LATITUDE

City	Latitude North	Population 1912	Total Population	Deaths from Cancer	Rate per 100,000 Population
	60°24′	77,464	383,100	376	98.1
ad	59°57′	1,990,874	9,815,760	8,400	85.6
nia	59°55′	243,967	1,205,625	1,229	101.9
olm	59°21′	346,848	1,712,593	2,047	119.5
rg	57°41′	172,006	821,817	759	91.2
en	57° 8′	164,932	814,268	941	115.6
rgh	55°57′	321,119	1,602,543	1,918	119.7
w	55°53′	785,600	3,918,239	4,190	106.9
v	55°45′	1,617,733	7,050,000	5,805	82.3
agen	55°41′	570,000	2,744,628	4,427	161.3
berg	54°43′	255,684	1,226,145	1,487	121.3
	54°36′	390,724	1,915,845	1,612	84.1
	53°46′	447,746	2,221,718	2,308	103.9
d	53°37′	466,408	2,261,241	1,894	83.8
rg	53°24′	1,063,201	5,006,244	5,276	105.4
ol	53°24′	752,021	3,716,551	3,592	96.6
ester	53°23′	724,168	3,460,469	3,321	96.0
	53°23′	306,218	1,516,918	1,701	112.1
	53° 5′	316,000	1,484,152	1,546	104.2
	52°30′	2,100,000	10,361,160	13,831	133.5
gham	52°30′	850,947	2,951,231	2,592	87.8
dam	52°22′	588,000	2,874,663	3,355	116.7
gue	52° 4′	294,540	1,375,718	1,490	108.3
lam	51°55′	445,137	2,137,458	1,980	92.6
	51°31′	4,531,572	22,671,154	25,322	111.7
	51°27′	359,400	1,784,270	1,792	100.4
	51°27′	305,024	1,414,452	856	60.5
	51°20′	605,755	2,848,078	2,817	98.9
p	51°13′	322,275	1,554,689	1,376	88.5
n	51° 2′	557,400	2,727,750	3,594	131.8
e	50°52′	544,329	2,546,035	2,404	94.4
s	50°51′	646,400	891,295	939	105.4
	50°38′	167,851	837,517	878	104.8
	50°37′	220,243	1,076,849	1,469	136.4
rt a/M	50° 6′	428,500	1,982,500	1,850	93.3
tal		23,980,086	112,912,675	119,374	105.7

Table 1 (continued)

Mortality from Cancer in Large Cities, according to Latitude

1908-1912

LATITUDE 50° N.–40° N.

City	Latitude North	Population 1912	Total Population	Deaths from Cancer	Rate per 100,000 Population
Winnipeg	49°56′	159,256	715,250	362	50.6
Le Havre	49°29′	136,905	677,065	917	135.4
Nuremberg	49°27′	345,416	1,649,630	1,721	104.3
Paris	48°50′	2,872,400	14,111,481	15,638	110.8
Nancy	48°40′	121,688	591,050	705	119.3
Vienna	48°14′	2,077,295	10,064,070	12,971	128.9
Munich	48° 9′	615,000	2,951,000	4,936	167.3
Seattle	47°36′	268,500	1,185,970	662	55.8
Basel	47°34′	135,632	657,827	752	114.3
Budapest	47°29′	905,244	4,337,060	4,450	102.6
Zurich	47°23′	199,000	945,026	1,053	111.4
Berne	46°57′	86,900	417,323	446	106.9
Quebec	46°48′	79,300	379,013	209	55.1
Geneva	46°12′	130,000	621,646	766	123.2
Lyon	45°42′	534,132	2,618,980	3,908	149.2
Montreal	45°30′	484,400	2,185,680	1,429	65.4
Milan	45°28′	609,974	2,942,130	3,562	121.1
St. John	45°14′	42,691	211,655	173	81.7
Turin	45° 4′	436,251	2,089,805	2,341	112.0
Minneapolis	44°58′	321,146	1,507,040	1,052	69.8
St. Paul	44°52′	221,832	1,073,718	802	74.7
Bordeaux	44°50′	263,624	1,042,820	1,184	113.5
Genoa	44°24′	275,972	1,342,350	1,393	103.8
Florence	43°45′	235,587	1,150,665	1,861	161.7
Nice	43°43′	144,682	710,345	710	99.8
Toronto	43°40′	414,000	1,819,052	1,313	72.2
Rochester	43° 8′	232,741	1,090,742	996	91.3
Milwaukee	43° 3′	398,219	1,869,282	1,292	69.1
Buffalo	42°53′	442,567	2,118,575	1,879	88.7
Boston	42°22′	715,711	3,352,926	3,545	105.7
Detroit	42°20′	515,156	2,328,827	1,528	65.6
Springfield, Mass	42° 6′	94,300	444,630	407	91.5
Rome	41°54′	550,057	2,670,945	2,679	100.3
Chicago	41°53′	2,282,623	10,926,412	8,618	78.9
Providence	41°50′	234,602	1,121,628	1,098	97.9
Hartford	41°46′	102,727	494,572	492	99.5
Cleveland	41°30′	596,443	2,803,315	1,960	69.9
New Haven	41°19′	138,721	668,025	616	92.2
Omaha	41°16′	128,404	620,478	538	86.7
Constantinople	41° 0′	1,200,000	5,750,000	2,001	34.8
Naples	40°51′	689,480	3,332,910	2,168	65.0
Newark	40°45′	373,141	1,737,345	1,313	75.6
Hoboken	40°44′	72,268	351,621	283	80.5
Jersey City	40°43′	281,811	1,338,895	833	62.2
Greater New York	40°43′	5,032,821	23,834,415	18,385	77.1
Pittsburgh	40°26′	550,385	2,669,525	1,773	66.4
Madrid	40°24′	578,000	2,825,985	2,673	94.6
Columbus	40° 0′	192,701	907,553	823	90.7
Total		27,519,705	131,256,257	121,216	92.4

Table 1 (continued)
Mortality from Cancer in Large Cities, according to Latitude 1908-1912

LATITUDE 40° N.–30° N.

City	Latitude North	Population 1912	Total Population	Deaths from Cancer	Rate per 100,000 Population
lphia..............	39°57′	1,600,072	7,745,040	6,610	85.3
....	39°44′	122,825	582,882	525	90.1
....	39°41′	229,287	1,066,905	887	83.1
polis..............	39°40′	246,546	1,168,247	947	81.1
ıre................	39°17′	568,391	2,792,425	2,500	89.5
City, Mo..........	39° 8′	265,306	1,241,903	981	79.0
gton..............	38°53′	341,541	1,655,346	1,455	87.9
ıs.................	38°38′	709,387	3,435,143	2,815	81.9
lle................	38°12′	227,766	1,119,637	764	68.2
ati................	38° 8′	371,129	1,817,955	1,680	92.4
)..................	38° 7′	344,227	1,689,745	892	52.8
....	37°58′	188,130	816,750	543	66.5
ncisco.............	37°48′	431,738	2,084,560	2,287	109.7
nd.................	37°32′	136,144	638,140	518	81.2
le.................	36° 9′	116,264	551,820	377	68.3
ır.................	36° 7′	19,017	97,823	81	82.8
....	35°39′	1,860,000	8,132,879	5,918	72.8
is.................	35° 8′	136,861	655,522	333	50.8
....	35° 1′	490,000	2,216,496	1,968	88.8
....	34°44′	1,260,000	6,014,365	3,281	54.6
geles..............	34° 5′	362,541	1,595,988	1,610	100.9
ı..................	33°33′	41,360	205,200	124	60.4
ton................	32°46′	59,437	294,162	173	58.8
ıh, Ga.............	32° 5′	67,228	325,320	182	55.9
tal................		10,195,197	47,944,253	37,451	78.1

LATITUDE 30° N.–10° N.

City	Latitude North	Population 1912	Total Population	Deaths from Cancer	Rate per 100,000 Population
leans..............	29°58′	349,471	1,695,376	1,440	84.9
....	23° 9′	353,509	1,644,513	1,689	102.7
a..................	22°34′	900,894	4,456,200	522	11.7
ng.................	22°18′	368,420	1,777,706	157	8.8
City...............	19°26′	491,500	2,355,330	1,165	49.5
....	14°35′	241,653	1,172,043	330	28.2
....	10°31′	75,000	375,000	393	104.8
tal................		2,780,447	13,476,168	5,696	42.3

LATITUDE 10° N.–10° S.

City	Latitude North	Population 1912	Total Population	Deaths from Cancer	Rate per 100,000 Population
ribo...............	5°49′	35,000	174,775	167	95.6
....	4°35′	121,257	607,465	545	89.7
re.................	1°17′	323,373	1,521,255	177	11.6
uil................	S. 2°11′	80,000	280,000	167	59.6
:al................		559,630	2,583,495	1,056	40.9

Table 1 (concluded)
Mortality from Cancer in Large Cities, according to Latitude
1908-1912

City	Latitude South	Population 1912	Total Population	Deaths from Cancer	Rate per 100,000 Population
	LATITUDE, 10° S.–30° S.				
Bahia	13° 0′	300,000	1,413,800	328	23.2
La Paz	16°30′	86,926	316,090	69	21.8
Bello Horizonte	20° 0′	39,845	112,280	41	36.5
Rio de Janeiro	22°54′	710,600	3,357,032	1,427	42.5
Sao Paulo	23°38′	400,000	1,694,000	769	45.4
Johannesburg	26°26′	249,000	1,076,862	370	34.4
Santiago del Estero	27°48′	20,580	96,080	36	37.5
Total		1,806,951	8,066,144	3,040	37.7
	LATITUDE, 30° S.–40° S.				
Pelotas	31°50′	38,207	181,201	147	81.1
Rosario de Santa Fe	33° 0′	225,600	937,604	684	73.0
Sydney	33°52′	675,800	3,114,640	2,805	90.1
Buenos Aires	34°36′	1,383,663	6,406,275	5,475	85.5
Montevideo	34°54′	355,017	1,657,498	1,937	116.9
Total		2,678,287	12,297,218	11,048	89.8

APPENDIX E

Table 2

rtality from Cancer in Large Cities of the Eastern and Western Hemispheres, according to Latitude 1908-1912

ty	Latitude North	Population 1912	Total Population	Deaths from Cancer	Rate per 100,000 Population
LATITUDE, 50° N.–40° N., EASTERN HEMISPHERE					
e.................	49°29′	136,905	677,065	917	135.4
erg...............	49°27′	345,416	1,649,630	1,721	104.3
....	48°50′	2,872,400	14,111,481	15,638	110.8
....	48°40′	121,688	591,050	705	119.3
....	48°14′	2,077,295	10,064,070	12,971	128.9
....	48° 9′	615,000	2,951,000	4,936	167.3
....	47°34′	135,632	657,827	752	114.3
t.................	47°29′	905,244	4,337,060	4,450	102.6
....	47°23′	199,000	945,026	1,053	111.4
....	46°57′	86,900	417,323	446	106.9
....	46°12′	130,000	621,646	766	123.2
....	45°42′	534,132	2,618,980	3,908	149.2
....	45°28′	609,974	2,942,130	3,562	121.1
....	45° 4′	436,251	2,089,805	2,341	112.0
x.................	44°50′	263,624	1,042,820	1,184	113.5
....	44°24′	275,972	1,342,350	1,393	103.8
....	43°45′	235,587	1,150,665	1,861	161.7
....	43°43′	144,682	710,345	710	99.8
....	41°54′	550,057	2,670,945	2,679	100.3
tinople...........	41° 0′	1,200,000	5,750,000	2,001	34.8
....	40°51′	689,480	3,332,910	2,168	65.0
....	40°24′	578,000	2,825,985	2,673	94.6
l.................		13,143,239	63,500,113	68,835	108.4
LATITUDE, 50° N.–40° N., WESTERN HEMISPHERE					
g.................	49°56′	159,256	715,250	362	50.6
....	47°36′	268,500	1,185,970	662	55.8
....	46°48′	79,300	379,013	209	55.1
l.................	45°30′	484,400	2,185,680	1,429	65.4
....	45°14′	42,691	211,655	173	81.7
olis..............	44°58′	321,146	1,507,040	1,052	69.8
....	44°52′	221,832	1,073,718	802	74.7
....	43°40′	414,000	1,819,052	1,313	72.2
r.................	43° 8′	232,741	1,090,742	996	91.3
ee................	43° 3′	398,219	1,869,282	1,292	69.1
....	42°53′	442,567	2,118,575	1,879	88.7
....	42°22′	715,711	3,352,926	3,545	105.7
....	42°20′	515,156	2,328,827	1,528	65.6
ld, Mass..........	42° 6′	94,300	444,630	407	91.5
....	41°53′	2,282,623	10,926,412	8,618	78.9
ce................	41°50′	234,602	1,121,628	1,098	97.9
....	41°46′	102,727	494,572	492	99.5
d.................	41°30′	596,443	2,803,315	1,960	69.9
en................	41°19′	138,721	668,025	616	92.2
....	41°16′	128,404	620,478	538	86.7
....	40°45′	373,141	1,737,345	1,313	75.6
....	40°44′	72,268	351,621	283	80.5
ty................	40°43′	281,811	1,338,895	833	62.2
New York..........	40°43′	5,032,821	23,834,415	18,385	77.1
h.................	40°26′	550,385	2,669,525	1,773	66.4
s.................	40° 0′	192,701	907,553	823	90.7
l.................		14,376,466	67,756,144	52,381	77.3

Table 2 (continued)
Mortality from Cancer in Large Cities of the Eastern and Western Hemispheres, according to Latitude
1908-1912

City	Latitude North	Population 1912	Total Population	Deaths from Cancer	Rate per 100,000 Population
LATITUDE, 40° N.–30° N., EASTERN HEMISPHERE					
Palermo	38° 7′	344,227	1,689,745	892	52.8
Athens	37°58′	188,130	816,750	543	66.5
Gibraltar	36° 7′	19,017	97,823	81	82.8
Tokio	35°39′	1,860,000	8,132,879	5,918	72.8
Kyoto	35° 1′	490,000	2,216,496	1,968	88.8
Osaka	34°44′	1,260,000	6,014,365	3,281	54.6
Total		4,161,374	18,968,058	12,683	66.9
LATITUDE, 40° N.–30° N., WESTERN HEMISPHERE					
Philadelphia	39°57′	1,600,072	7,745,040	6,610	85.3
Dayton	39°44′	122,825	582,882	525	90.1
Denver	39°41′	229,287	1,066,905	887	83.1
Indianapolis	39°40′	246,546	1,168,247	947	81.1
Baltimore	39°17′	568,391	2,792,425	2,500	89.5
Kansas City, Mo	39° 8′	265,306	1,241,903	981	79.0
Washington	38°53′	341,541	1,655,346	1,455	87.9
St. Louis	38°38′	709,387	3,435,143	2,815	81.9
Louisville	38°12′	227,766	1,119,637	764	68.2
Cincinnati	38° 8′	371,129	1,817,955	1,680	92.4
San Francisco	37°48′	431,738	2,084,560	2,287	109.7
Richmond	37°32′	136,144	638,140	518	81.2
Nashville	36° 9′	116,264	551,820	377	68.3
Memphis	35° 8′	136,861	655,522	333	50.8
Los Angeles	34° 5′	362,541	1,595,988	1,610	100.9
Augusta	33°33′	41,360	205,200	124	60.4
Charleston	32°46′	59,437	294,162	173	58.8
Savannah, Ga	32° 5′	67,228	325,320	182	55.9
Total		6,033,823	28,976,195	24,768	85.5
LATITUDE, 30° N.–10° N., EASTERN HEMISPHERE					
Calcutta	22°34′	900,894	4,456,200	522	11.7
Hongkong	22°18′	368,420	1,777,706	157	8.8
Manila	14°35′	241,653	1,172,043	330	28.2
Total		1,510,967	7,405,949	1,009	13.6
LATITUDE, 30° N.–10° N., WESTERN HEMISPHERE					
New Orleans	29°58′	349,471	1,695,376	1,440	84.9
Havana	23° 9′	353,509	1,644,513	1,689	102.7
Mexico City	19°26′	491,500	2,355,330	1,165	49.5
Caracas	10°31′	75,000	375,000	393	104.8
Total		1,269,480	6,070,219	4,687	77.2

Table 2 (concluded)
Mortality from Cancer in Large Cities of the Eastern and Western Hemispheres, according to Latitude
1908-1912

City	Latitude North	Population 1912	Total Population	Deaths from Cancer	Rate per 100,000 Population
LATITUDE, 10° N.–10° S., EASTERN HEMISPHERE					
Singapore	1°17′	323,373	1,521,255	177	11.6
LATITUDE, 10° N.–10° S., WESTERN HEMISPHERE					
Paramaribo	5°49′	35,000	174,775	167	95.6
Bogota	4°35′	121,257	607,465	545	89.7
Guayaquil	S. 2°11′	80,000	280,000	167	59.6
Total		236,257	1,062,240	879	82.7
LATITUDE, 10° S.–30° S., EASTERN HEMISPHERE					
Johannesburg	26°26′	249,000	1,076,862	370	34.4
LATITUDE, 10° S.–30° S., WESTERN HEMISPHERE					
Bahia	13° 0′	300,000	1,413,800	328	23.2
La Paz	16°30′	86,926	316,090	69	21.8
Bello Horizonte	20° 0′	39,845	112,280	41	36.5
Rio de Janeiro	22°54′	710,600	3,357,032	1,427	42.5
Sao Paulo	23°38′	400,000	1,694,000	769	45.4
Santiago del Estero	27°48′	20,580	96,080	36	37.5
Total		1,557,951	6,989,282	2,670	38.2
LATITUDE, 30° S.–40° S., EASTERN HEMISPHERE					
Sydney	33°52′	675,800	3,114,640	2,805	90.1
LATITUDE, 30° S.–40° S., WESTERN HEMISPHERE					
Pelotas	31°50′	38,207	181,201	147	81.1
Rosario de Santa Fe	33° 0′	225,600	937,604	684	73.0
Buenos Aires	34°36′	1,383,663	6,406,275	5,475	85.5
Montevideo	34°54′	355,017	1,657,498	1,937	116.9
Total		2,002,487	9,182,578	8,243	89.8

APPENDIX E

Table 3

Mortality from Cancer in Cities, according to Size, 1908-1912

No. of Cities		Population 1912	Total Population	Deaths from Cancer	Rate per 100,000 Population
14	1,000,000 and over	30,872,254	147,889,255	137,531	93.0
26	500,000– 1,000,000	17,049,274	78,667,982	74,482	94.7
41	250,000– 500,000	14,858,442	70,138,157	58,804	83.8
27	125,000– 250,000	5,140,049	24,367,754	21,946	90.1
22	Less than 125,000	1,600,284	7,473,062	6,118	81.9
130		69,520,303	328,536,210	298,881	91.0

Cities with 1,000,000 Population and Over

		Population 1912	Total Population	Deaths from Cancer	Rate per 100,000 Population
1	Greater New York	5,032,821	23,834,415	18,385	77.1
2	London	4,531,572	22,671,154	25,322	111.7
3	Paris	2,872,400	14,111,481	15,638	110.8
4	Chicago	2,282,623	10,926,412	8,618	78.9
5	Berlin	2,100,000	10,361,160	13,831	133.5
6	Vienna	2,077,295	10,064,070	12,971	128.9
7	Petrograd	1,990,874	9,815,760	8,400	85.6
8	Tokio	1,860,000	8,132,879	5,918	72.8
9	Moscow	1,617,733	7,050,000	5,805	82.3
10	Philadelphia	1,600,072	7,745,040	6,610	85.3
11	Buenos Aires	1,383,663	6,406,275	5,475	85.5
12	Osaka	1,260,000	6,014,365	3,281	54.6
13	Constantinople	1,200,000	5,750,000	2,001	34.8
14	Hamburg	1,063,201	5,006,244	5,276	105.4
	Total	30,872,254	147,889,255	137,531	93.0

Cities with 500,000 to 1,000,000 Population

		Population 1912	Total Population	Deaths from Cancer	Rate per 100,000 Population
1	Budapest	905,244	4,337,060	4,450	102.6
2	Calcutta	900,894	4,456,200	522	11.7
3	Glasgow	785,600	3,918,239	4,190	106.9
4	Birmingham	850,947	2,951,231	2,592	87.8
5	Liverpool	752,021	3,716,551	3,592	96.6
6	Manchester	724,168	3,460,469	3,321	96.0
7	Boston	715,711	3,352,926	3,545	105.7
8	Rio de Janeiro	710,600	3,357,032	1,427	42.5
9	St. Louis	709,387	3,435,143	2,815	81.9
10	Naples	689,480	3,332,910	2,168	65.0
11	Sydney	675,800	3,114,640	2,805	90.1
12	Brussels	646,400	891,295	939	105.4
13	Munich	615,000	2,951,000	4,936	167.3
14	Milan	609,974	2,942,130	3,562	121.1
15	Leipzig	605,755	2,848,078	2,817	98.9
16	Cleveland	596,443	2,803,315	1,960	69.9
17	Amsterdam	588,000	2,874,663	3,355	116.7
18	Madrid	578,000	2,825,985	2,673	94.6
19	Copenhagen	570,000	2,744,628	4,427	161.3
20	Baltimore	568,391	2,792,425	2,500	89.5
21	Dresden	557,400	2,727,750	3,594	131.8
22	Pittsburgh	550,385	2,669,525	1,773	66.4
23	Rome	550,057	2,670,945	2,679	100.3
24	Cologne	544,329	2,546,035	2,404	94.4
25	Lyon	534,132	2,618,980	3,908	149.2
26	Detroit	515,156	2,328,827	1,528	65.6
	Total	17,049,274	78,667,982	74,482	94.7

Table 3 (continued)

Mortality from Cancer in Cities, according to Size, 1908-1912

Cities with 250,000 to 500,000 Population

	City	Population 1912	Total Population	Deaths from Cancer	Rate per 100,000 Population
1	Mexico City	491,500	2,355,330	1,165	49.5
2	Kyoto	490,000	2,216,496	1,968	88.8
3	Montreal	484,400	2,185,680	1,429	65.4
4	Sheffield	466,408	2,261,241	1,894	83.8
5	Leeds	447,746	2,221,718	2,308	103.9
6	Rotterdam	445,137	2,137,458	1,980	92.6
7	Buffalo	442,567	2,118,575	1,879	88.7
8	Turin	436,251	2,089,805	2,341	112.0
9	San Francisco	431,738	2,084,560	2,287	109.7
10	Frankfurt a/M	428,500	1,982,500	1,850	93.3
11	Toronto	414,000	1,819,052	1,313	72.2
12	Sao Paulo	400,000	1,694,000	769	45.4
13	Milwaukee	398,219	1,869,282	1,292	69.1
14	Belfast	390,724	1,915,845	1,612	84.1
15	Newark	373,141	1,737,345	1,313	75.6
16	Cincinnati	371,129	1,817,955	1,680	92.4
17	Hongkong	368,420	1,777,706	157	8.8
18	Los Angeles	362,541	1,595,988	1,610	100.9
19	Bristol	359,400	1,784,270	1,792	100.4
20	Montevideo	355,017	1,657,498	1,937	116.9
21	Havana	353,509	1,644,513	1,689	102.7
22	New Orleans	349,471	1,695,376	1,440	84.9
23	Stockholm	346,848	1,712,593	2,047	119.5
24	Nuremberg	345,416	1,649,630	1,721	104.3
25	Palermo	344,227	1,689,745	892	52.8
26	Washington	341,541	1,655,346	1,455	87.9
27	Singapore	323,373	1,521,255	177	11.6
28	Antwerp	322,275	1,554,689	1,376	88.5
29	Minneapolis	321,146	1,507,040	1,052	69.8
30	Edinburgh	321,119	1,602,543	1,918	119.7
31	Bremen	316,000	1,484,152	1,546	104.2
32	Dublin	306,218	1,516,918	1,701	112.1
33	Essen	305,024	1,414,452	856	60.5
34	Bahia	300,000	1,413,800	328	23.2
35	The Hague	294,540	1,375,718	1,490	108.3
36	Jersey City	281,811	1,338,895	833	62.2
37	Genoa	275,972	1,342,350	1,393	103.8
38	Seattle	268,500	1,185,970	662	55.8
39	Kansas City, Mo.	265,306	1,241,903	981	79.0
40	Bordeaux	263,624	1,042,820	1,184	113.5
41	Königsberg	255,684	1,226,145	1,487	121.3
	Total	14,858,442	70,138,157	58,804	83.8

Table 3 (concluded)

Mortality from Cancer in Cities, according to Size, 1908-1912

Cities with 125,000 to 250,000 Population

	City	Population 1912	Total Population	Deaths from Cancer	Rate per 100,000 Population
1	Johannesburg	249,000	1,076,862	370	34.4
2	Indianapolis	246,546	1,168,247	947	81.1
3	Kristiania	243,967	1,205,625	1,229	101.9
4	Manila	241,653	1,172,043	330	28.2
5	Florence	235,587	1,150,665	1,861	161.7
6	Providence	234,602	1,121,628	1,098	97.9
7	Rochester	232,741	1,090,742	996	91.3
8	Denver	229,287	1,066,905	887	83.1
9	Louisville	227,766	1,119,637	764	68.2
10	Rosario de Santa Fe	225,600	937,604	684	73.0
11	St. Paul	221,832	1,073,718	802	74.7
12	Lille	220,243	1,076,849	1,469	136.4
13	Zurich	199,000	945,026	1,053	111.4
14	Columbus	192,701	907,553	823	90.7
15	Athens	188,130	816,750	543	66.5
16	Göteborg	172,006	821,817	759	91.2
17	Liege	167,851	837,517	878	104.8
18	Aberdeen	164,932	814,268	941	115.6
19	Winnipeg	159,256	715,250	362	50.6
20	Nice	144,682	710,345	710	99.8
21	New Haven	138,721	668,025	616	92.2
22	Le Havre	136,905	677,065	917	135.4
23	Memphis	136,861	655,522	333	50.8
24	Richmond	136,144	638,140	518	81.2
25	Basel	135,632	657,827	752	114.3
26	Geneva	130,000	621,646	766	123.2
27	Omaha	128,404	620,478	538	86.7
	Total	5,140,049	24,367,754	21,946	90.1

Cities with Less Than 125,000 Population

	City	Population 1912	Total Population	Deaths from Cancer	Rate per 100,000 Population
1	Dayton	122,825	582,882	525	90.1
2	Nancy	121,688	591,050	705	119.3
3	Bogota	121,257	607,465	545	89.7
4	Nashville	116,264	551,820	377	68.3
5	Hartford	102,727	494,572	492	99.5
6	Springfield, Mass	94,300	444,630	407	91.5
7	La Paz	86,926	316,090	69	21.8
8	Bern	86,900	417,323	446	106.9
9	Guayaquil	80,000	280,000	167	59.6
10	Quebec	79,300	379,013	209	55.1
11	Bergen	77,464	383,100	376	98.1
12	Caracas	75,000	375,000	393	104.8
13	Hoboken	72,268	351,621	283	80.5
14	Savannah	67,228	325,320	182	55.9
15	Charleston	59,437	294,162	173	58.8
16	St. John	42,691	211,655	173	81.7
17	Augusta, Ga	41,360	205,200	124	60.4
18	Bello Horizonte	39,845	112,280	41	36.5
19	Pelotas	38,207	181,201	147	81.1
20	Paramaribo	35,000	174,775	167	95.6
21	Santiago del Estero	20,580	96,080	36	37.5
22	Gibraltar	19,017	97,823	81	82.8
	Total	1,600,284	7,473,062	6,118	81.9

APPENDIX E

Table 4

Comparative Mortality from Cancer, by Organs and Parts in Thirteen Principal Countries of the World

Australian Commonwealth, 1908-1912

	Deaths from Cancer	Rate per 100,000 Population
Stomach and Liver	6,024	27.4
Skin	503	2.3
		Rate per 100,000 Female Population
Female generative organs	1,635	15.5
Female breast	1,117	10.6

Total population.................21,997,568
Female population...............10,573,554

General cancer death rate................ 73.2

Bavaria, 1905-1910

	Deaths from Cancer	Rate per 100,000 Population
Stomach and liver	23,911	59.4
Skin	311	0.8
		Rate per 100,000 Female Population
Female generative organs	4,434	21.6
Female breast	1,871	9.1

Total population.................40,234,987
Female population...............20,507,907

General cancer death rate................ 109.4

Cuba, 1908-1912

	Deaths from Cancer	Rate per 100,000 Population
Stomach and liver	1,383	12.7
Skin	215	2.0
		Rate per 100,000 Female Population
Female generative organs	973	18.9
Female breast	232	4.5

Total population.................10,892,077
Female population............... 5,157,276

General cancer death rate................ 44.6

Table 4 (continued)
Comparative Mortality from Cancer, by Organs and Parts in Thirteen Principal Countries of the World

England and Wales, 1906-1910

	Deaths from Cancer	Rate per 100,000 Population
Stomach and liver	55,105	31.4
Skin	3,731	2.1
		Rate per 100,000 Female Population
Female generative organs	21,908	24.2
Female breast	16,185	17.9

Total population. 175,333,013
Female population. 90,535,741

General cancer death rate. 94.0

Holland, 1906-1910

	Deaths from Cancer	Rate per 100,000 Population
Stomach and liver	17,878	62.2
Skin	411	1.4
		Rate per 100,000 Female Population
Female generative organs	1,919	13.2
Female breast	1,390	9.6

Total population. 28,725,355
Female population. 14,506,305

General cancer death rate. 103.5

Ireland, 1906-1910

	Deaths from Cancer	Rate per 100,000 Population
Stomach and liver	6,795	31.0
Skin	589	2.7
		Rate per 100,000 Female Population
Female generative organs	1,415	12.8
Female breast	1,545	14.0

Total population. 21,942,708
Female population. 11,012,689

General cancer death rate. 78.8

Table 4 (continued)
Comparative Mortality from Cancer, by Organs and Parts in Thirteen Principal Countries of the World

Italy, 1906-1910

	Deaths from Cancer	Rate per 100,000 Population
Stomach and liver	44,330	26.2
Skin	..	..
		Rate per 100,000 Female Population
Female generative organs	13,741	16.0
Female breast	5,019	5.8

Total population 169,081,524
Female population 85,896,061

General cancer death rate 63.6

Japan, 1909-1910

	Deaths from Cancer	Rate per 100,000 Population
Stomach and liver	39,861	40.0
Skin	734	0.7
		Rate per 100,000 Female Population
Female generative organs	10,322	20.9
Female breast	878	1.8

Total population 99,728,840
Female population 49,505,396

General cancer death rate 65.5

Norway, 1906-1910

	Deaths from Cancer	Rate per 100,000 Population
Stomach and liver	7,130	61.4
Skin	..	..
		Rate per 100,000 Female Population
Female generative organs	692	11.5
Female breast	440	7.3

Total population 11,606,600
Female population 5,993,116

General cancer death rate 96.6

Table 4 (continued)
Comparative Mortality from Cancer, by Organs and Parts in Thirteen Principal Countries of the World

Scotland, 1906-1910

	Deaths from Cancer	Rate per 100,000 Population
Stomach and liver	8,417	36.0
Skin	396	1.7
		Rate per 100,000 Female Population
Female generative organs	2,479	20.6
Female breast	1,856	15.4

Total population.................23,394,061
Female population...............12,047,942

General cancer death rate................ 99.7

Switzerland, 1906-1910

	Deaths from Cancer	Rate per 100,000 Population
Stomach and liver	12,838	70.4
Skin	344	1.9
		Rate per 100,000 Female Population
Female generative organs	1,995	21.4
Female breast	1,264	13.6

Total population.................18,237,395
Female population............... 9,301,072

General cancer death rate................ 125.9

Uruguay, 1906-1910

	Deaths from Cancer	Rate per 100,000 Population
Stomach and liver	1,880	35.6
Skin	57	1.1
		Rate per 100,000 Female Population
Female generative organs	317	12.2
Female breast	96	3.7

Total population.................5,277,942
Female population...............2,592,524

General cancer death rate................ 66.0

Table 4 (concluded)

Comparative Mortality from Cancer, by Organs and Parts in Thirteen Principal Countries of the World

United States Registration Area, 1906-1910

	Deaths from Cancer	Rate per 100,000 Population
Stomach and liver	66,976	28.3
Skin	6,338	2.7
		Rate per 100,000 Female Population
Female generative organs	25,589	22.1
Female breast	15,349	13.3

Total population 236,504,736
Female population 115,779,973

General cancer death rate 72.6

APPENDIX

F

PART I

Cancer Mortality Statistics of the United States Registration Area

Table		Page
1	Estimated Mortality from Cancer, Continental United States, 1900-1913	422
2	Mortality from Cancer, United States Registration Area, 1900-1913	422
3	Mortality from Cancer, United States Registration States, 1900-1913	422
4	Mortality from Cancer, United States Registration Cities, 1900-1913	422
5	Mortality from Cancer, California, 1906-1913	422
6	Mortality from Cancer, Colorado, 1906-1913	422
7	Mortality from Cancer, Connecticut, 1900-1913	423
8	Mortality from Cancer, Indiana, 1900-1913	423
9	Mortality from Cancer, Kentucky, 1911-1913	423
10	Mortality from Cancer, Maine, 1900-1913	423
11	Mortality from Cancer, Maryland, 1906-1913	423
12	Mortality from Cancer, Massachusetts, 1900-1913	423
13	Mortality from Cancer, Michigan, 1900-1913	424
14	Mortality from Cancer, Minnesota, 1910-1913	424
15	Mortality from Cancer, Missouri, 1911-1913	424
16	Mortality from Cancer, Montana, 1910-1913	424
17	Mortality from Cancer, New Hampshire, 1900-1913	424
18	Mortality from Cancer, New Jersey, 1900-1913	425
19	Mortality from Cancer, New York, 1900-1913	425
20	Mortality from Cancer, North Carolina, 1910-1913	425
21	Mortality from Cancer, Ohio, 1909-1913	425
22	Mortality from Cancer, Pennsylvania, 1906-1913	425
23	Mortality from Cancer, Rhode Island, 1900-1913	426
24	Mortality from Cancer, South Dakota, 1906-1909	426

APPENDIX F (PART I)

Table		Page
25	Mortality from Cancer, Utah, 1910-1913	426
26	Mortality from Cancer, Vermont, 1900-1913	426
27	Mortality from Cancer, Washington, 1908-1913	426
28	Mortality from Cancer, Wisconsin, 1908-1913	426
29	Estimated Mortality from Malignant and Benign Tumors, Continental United States, 1900-1913	427
30	Estimated Mortality from Benign Tumors, Continental United States, 1900-1913	427
31	Mortality from Cancer, United States Registration Area, Males, 1900-1913	427
32	Mortality from Cancer, United States Registration Area, Females, 1900-1913	427
33	Mortality from Benign Tumors, United States Registration Area, 1900-1913	428
34	Mortality from Benign Tumors, United States Registration Area, Males, 1900-1913	428
35	Mortality from Benign Tumors, United States Registration Area, Females, 1900-1913	429
36	Mortality from Ulcer of Stomach, by Sex, United States Registration Area, 1900-1913	429
37	Mortality from Biliary Calculi, by Sex, United States Registration Area, 1900-1913	430
38	Mortality from Calculi of the Urinary Tract, by Sex, United States Registration Area, 1900-1913	430
39	Mortality from Cancer, by Race, United States Registration Area, 1910-1912	431
40	Mortality from Cancer, Urban and Rural, United States Registration States, 1900-1913	431
41	Mortality from Cancer of the Buccal Cavity, by Sex, United States Registration Area, 1900-1913	432
42	Mortality from Cancer of the Stomach and Liver, by Sex, United States Registration Area, 1900-1913	432
43	Mortality from Cancer of the Peritoneum, Intestines and Rectum, by Sex, United States Registration Area, 1900-1913	433
44	Mortality from Cancer of the Female Generative Organs and Female Breast, United States Registration Area, 1900-1913	433
45	Mortality from Cancer of the Skin, by Sex, United States Registration Area, 1900-1913	434
46	Mortality from Cancer of Other or Not Specified Organs and Parts, by Sex, United States Registration Area, 1900-1913	434
47	Estimated Mortality from Cancer, by Organs and Parts, Continental United States, 1900-1913	435
48	Population Statistics, by Age and Sex, United States Registration Area, 1903-1912	435

APPENDIX F (PART I)

Table | Page

49 Mortality from Cancer, by Age and Sex, United States Registration Area, 1903-1912 436

50 Mortality from Cancer of the Buccal Cavity, by Age and Sex, United States Registration Area, 1903-1912 436

51 Mortality from Cancer of the Stomach and Liver, by Age and Sex, United States Registration Area, 1903-1912 437

52 Mortality from Cancer of the Peritoneum, Intestines and Rectum, by Age and Sex, United States Registration Area, 1903-1912 437

53 Mortality from Cancer of the Female Generative Organs and Female Breast, by Age, United States Registration Area, 1903-1912 438

54 Mortality from Cancer of the Skin, by Age and Sex, United States Registration Area, 1903-1912 438

55 Mortality from Cancer of Other or Not Specified Organs and Parts, by Age and Sex, United States Registration Area, 1903-1912 439

56 Mortality from Cancer, Urban and Rural, by Organs and Parts, United States Registration States, 1908-1912 439

57 Proportion of Mortality from Cancer to All Causes, by Age and Sex, United States Registration Area, 1908-1912 440

58 Mortality from Cancer and Other Important Causes of Death, by Age and Sex, United States Registration Area, 1908-1912 440

59 Mortality from Cancer, by Months, New York, Massachusetts, New Hampshire and Connecticut, 1902-1911 441

60 Comparative Cancer Death Rate, by Age and Sex, United States Registration Area, 1901-1911 442

61 Mortality from Cancer, by Age, Males, United States Registration Area, 1903-1907 Compared with 1908-1912 443

62 Mortality from Cancer, by Age, Females, United States Registration Area, 1903-1907 Compared with 1908-1912 443

63 Mortality from Cancer of the Buccal Cavity, by Age, Males, United States Registration Area, 1903-1907 Compared with 1908-1912 444

64 Mortality from Cancer of the Buccal Cavity, by Age, Females, United States Registration Area, 1903-1907 Compared with 1908-1912 444

65 Mortality from Cancer of the Stomach and Liver, by Age, Males, United States Registration Area, 1903-1907 Compared with 1908-1912 445

66 Mortality from Cancer of the Stomach and Liver, by Age, Females, United States Registration Area, 1903-1907 Compared with 1908-1912 445

67 Mortality from Cancer of the Peritoneum, Intestines and Rectum, by Age, Males, United States Registration Area, 1903-1907 Compared with 1908-1912 446

68 Mortality from Cancer of the Peritoneum, Intestines and Rectum, by Age, Females, United States Registration Area, 1903-1907 Compared with 1908-1912 446

APPENDIX F (PART 1)

Table		Page
39	Mortality from Cancer of the Female Generative Organs, by Age, United States Registration Area, 1903-1907 Compared with 1908-1912	447
0	Mortality from Cancer of the Female Breast, by Age, United States Registration Area, 1903-1907 Compared with 1908-1912	447
1	Mortality from Cancer of the Skin, by Age, Males, United States Registration Area, 1903-1907 Compared with 1908-1912	448
2	Mortality from Cancer of the Skin, by Age, Females, United States Registration Area, 1903-1907 Compared with 1908-1912	448
3	Mortality from Cancer of Other or Not Specified Organs and Parts, by Age, Males, United States Registration Area, 1903-1907 Compared with 1908-1912	449
4	Mortality from Cancer of Other or Not Specified Organs and Parts, by Age, Females, United States Registration Area, 1903-1907 Compared with 1908-1912	449

Table 1
Estimated Mortality from Cancer Continental United States 1900-1913

Year	Population Continental United States	Cancer Death Rate per 100,000 U. S. Registration Area	Estimated No. of Deaths from Cancer
1900	75,994,575	62.9	47,829
1901	77,592,344	64.3	49,890
1902	79,190,113	65.1	51,542
1903	80,787,882	68.3	55,153
1904	82,385,651	70.2	57,794
1905	83,983,420	71.4	59,931
1906	85,581,189	69.1	59,155
1907	87,178,958	70.9	61,840
1908	88,776,727	71.5	63,494
1909	90,374,496	73.8	66,731
1910	91,972,266	76.2	70,099
1911	93,570,036	74.3	69,494
1912	95,167,806	77.0	73,282
1913	96,765,576	78.9	76,319

Table 2
Mortality from Cancer United States Registration Area 1900-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	30,794,273	19,381	62.9
1901	31,370,952	20,171	64.3
1902	32,029,815	20,847	65.1
1903	32,701,083	22,325	68.3
1904	33,349,137	23,395	70.2
1905	34,094,605	24,330	71.4
1906	41,983,419	29,020	69.1
1907	43,016,990	30,514	70.9
1908	46,789,913	33,465	71.5
1909	50,870,518	37,562	73.8
1910	53,843,896	41,039	76.2
1911	59,275,977	44,024	74.3
1912	60,427,247	46,531	77.0
1913	63,298,718	49,928	78.9

Table 3
Mortality from Cancer United States Registration States* 1900-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	19,965,149	12,769	63.5
1901	20,307,043	13,438	66.2
1902	20,648,941	13,653	66.1
1903	20,990,841	14,650	69.8
1904	21,336,715	15,247	71.5
1905	21,736,908	15,983	73.5
1906	33,836,029	23,399	69.2
1907	34,608,896	24,666	71.3
1908	38,705,861	27,617	71.4
1909	44,281,685	32,723	73.9
1910	47,807,766	36,364	76.1
1911	54,385,234	40,229	74.0
1912	55,252,123	42,464	76.9
1913	58,312,595	45,833	78.6

*Includes District of Columbia

Table 4
Mortality from Cancer United States Registration Cities 1900-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	21,504,735	13,672	63.6
1901	22,252,010	14,450	64.9
1902	22,858,803	15,038	65.8
1903	23,465,153	16,173	68.9
1904	24,041,724	17,040	70.9
1905	24,729,925	17,670	71.5
1906	26,342,431	19,492	74.0
1907	27,145,619	20,384	75.1
1908	28,501,322	21,602	75.8
1909	29,655,238	23,325	78.7
1910	31,223,935	25,180	80.6
1911	32,376,200	26,310	81.3
1912	33,304,948	27,949	83.9
1913	34,230,283	29,767	87.0

Table 5
Mortality from Cancer, California 1906-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	2,034,859	1,517	74.6
1907	2,125,238	1,606	75.6
1908	2,215,618	1,774	80.1
1909	2,305,998	1,983	86.0
1910	2,396,378	2,013	84.0
1911	2,486,757	2,053	82.6
1912	2,577,137	2,338	90.7
1913	2,667,516	2,603	97.6

Table 6
Mortality from Cancer, Colorado 1906-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	699,451	316	45.2
1907	725,712	346	47.7
1908	751,973	402	53.5
1909	778,234	419	53.8
1910	804,495	468	58.2
1911	830,755	459	55.3
1912	857,016	497	58.0
1913	883,276	448	50.7

Table 7

tality from Cancer, Connecticut

1900-1913

Population	Deaths from Cancer	Rate per 100,000 Population
910,161	624	68.6
931,055	650	69.8
951,949	643	67.5
972,844	731	75.1
993,739	670	67.4
1,014,634	751	74.0
1,035,529	811	78.3
1,056,424	819	77.5
1,077,319	790	73.3
1,098,214	882	80.3
1,119,109	893	79.8
1,140,003	895	78.5
1,160,898	945	81.4
1,181,793	1,006	85.1

Table 8

Mortality from Cancer, Indiana

1900-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	2,518,018	1,077	42.8
1901	2,536,692	1,125	44.3
1902	2,555,367	1,237	48.4
1903	2,574,042	1,289	50.1
1904	2,592,717	1,334	51.5
1905	2,611,392	1,482	56.8
1906	2,630,067	1,456	55.4
1907	2,648,742	1,567	59.2
1908	2,667,417	1,795	67.3
1909	2,686,092	1,856	69.1
1910	2,704,767	1,898	70.2
1911	2,723,441	1,943	71.3
1912	2,742,117	2,030	74.0
1913	2,760,792	2,239	81.1

Table 9

rtality from Cancer, Kentucky

1911-1913

Population	Deaths from Cancer	Rate per 100,000 Population
2,307,369	986	42.7
2,321,823	1,043	44.9
2,336,277	1,122	48.0

Table 10

Mortality from Cancer, Maine

1900-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	694,870	518	74.5
1901	699,721	575	82.2
1902	704,572	608	86.3
1903	709,423	599	84.4
1904	714,274	611	85.5
1905	719,125	661	91.9
1906	723,976	616	85.1
1907	728,827	727	99.7
1908	733,678	695	94.7
1909	738,530	727	98.4
1910	743,382	754	101.4
1911	748,233	738	98.6
1912	753,085	829	110.1
1913	757,936	815	107.5

Table 11

Mortality from Cancer

Maryland, 1906-1913

Population	Deaths from Cancer	Rate per 100,000 Population
1,254,146	767	61.2
1,265,012	785	62.1
1,275,878	821	64.3
1,286,744	800	62.2
1,297,610	942	72.6
1,308,476	955	73.0
1,319,343	1,042	79.0
1,330,209	1,102	82.8

Table 12

Mortality from Cancer

Massachusetts, 1900-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	2,805,346	2,092	74.6
1901	2,845,012	2,183	76.7
1902	2,884,679	2,233	77.4
1903	2,924,346	2,367	80.9
1904	2,964,013	2,607	88.0
1905	3,015,[illegible]73	2,682	88.9
1906	3,089,029	2,748	89.0
1907	3,162,186	2,883	91.2
1908	3,235,343	2,927	90.5
1909	3,308,500	2,972	89.8
1910	3,381,657	3,159	93.4
1911	3,454,813	3,262	94.4
1912	3,491,888	3,407	97.6
1913	3,548,705	3,597	101.4

Table 13
Mortality from Cancer, Michigan
1900-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	2,420,982	1,482	61.2
1901	2,448,240	1,468	60.0
1902	2,475,498	1,476	59.6
1903	2,502,757	1,689	67.5
1904	2,533,990	1,706	67.3
1905	2,581,676	1,643	63.6
1906	2,629,362	1,748	66.5
1907	2,677,048	1,741.	65.0
1908	2,724,734	1,924	70.6
1909	2,772,421	1,953	70.4
1910	2,820,108	2,112	74.9
1911	2,867,794	2,137	74.5
1912	2,897,207	2,276	78.6
1913	2,936,618	2,392	81.5

Table 14
Mortality from Cancer, Minnesota
1910-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1910	2,079,801	1,400	67.3
1911	2,099,451	1,423	67.8
1912	2,148,235	1,498	69.7
1913	2,181,077	1,638	75.1

Table 15
Mortality from Cancer, Missouri
1911-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1911	3,321,094	1,974	59.4
1912	3,335,080	2,142	64.2
1913	3,353,983	2,250	67.1

Table 16
Mortality from Cancer, Montana
1910-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1910	378,853	157	41.4
1911	392,293	157	40.0
1912	405,734	164	40.4
1913	419,174	207	49.4

Table 17
Mortality from Cancer
New Hampshire
1900-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	411,748	296	71.9
1901	413,670	364	88.0
1902	415,592	340	81.8
1903	417,514	327	78.3
1904	419,436	342	81.5
1905	421,358	359	85.2
1906	423,280	386	91.2
1907	425,203	418	98.3
1908	427,126	384	89.9
1909	429,049	401	93.5
1910	430,972	424	98.4
1911	432,894	419	96.8
1912	434,818	467	107.4
1913	436,740	456	104.4

Table 18
Mortality from Cancer
New Jersey
1900-1913

Population	Deaths from Cancer	Rate per 100,000 Population
1,883,669	1,016	53.9
1,935,763	1,126	58.2
1,987,858	1,064	53.5
2,039,953	1,189	58.3
2,092,048	1,205	57.6
2,150,861	1,356	63.0
2,231,481	1,451	65.0
2,312,101	1,470	63.6
2,392,721	1,553	64.9
2,473,342	1,681	68.0
2,553,963	1,891	74.0
2,634,583	1,966	74.6
2,683,309	2,054	76.5
2,749,486	2,156	78.4

Table 19
Mortality from Cancer
New York
1900-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	7,268,894	4,847	66.7
1901	7,428,576	5,186	69.8
1902	7,588,259	5,227	68.9
1903	7,747,942	5,558	71.7
1904	7,907,625	5,834	73.8
1905	8,085,194	6,139	75.9
1906	8,299,820	6,273	75.6
1907	8,514,447	6,614	77.7
1908	8,729,074	6,797	77.9
1909	8,943,701	7,262	81.2
1910	9,158,328	7,726	84.4
1911	9,372,954	8,091	86.3
1912	9,526,146	8,209	86.2
1913	9,712,954	8,531	87.8

Table 20
ality from Cancer, N. Carolina *
1910-1913

Population	Deaths from Cancer	Rate per 100,000 Population
361,941	171	47.2
374,314	205	54.8
385,790	219	56.8
396,927	190	47.9

udes only municipalities having a population or over in 1900.

Table 21
Mortality from Cancer, Ohio
1909-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1909	4,718,251	3,470	73.5
1910	4,779,981	3,599	75.3
1911	4,841,710	3,699	76.4
1912	4,903,439	3,936	80.3
1913	4,965,169	4,061	81.8

Table 22
Mortality from Cancer, Pennsylvania
1906-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	7,141,766	4,208	58.9
1907	7,279,791	4,420	60.7
1908	7,417,816	4,520	60.9
1909	7,555,841	4,845	64.1
1910	7,693,866	5,100	66.3
1911	7,831,890	5,197	66.4
1912	7,969,916	5,426	68.1
1913	8,107,942	5,854	72.2

Table 23
Mortality from Cancer
Rhode Island
1900-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	428,556	302	70.5
1901	438,861	319	72.7
1902	449,166	370	82.4
1903	459,471	355	77.3
1904	469,776	407	86.6
1905	481,150	386	80.2
1906	493,976	384	77.7
1907	506,802	456	90.0
1908	519,628	427	82.2
1909	532,455	466	87.5
1910	545,282	474	86.9
1911	558,108	491	88.0
1912	568,114	510	89.8
1913	579,665	541	93.3

Table 24
Mortality from Cancer
South Dakota
1906-1909

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	487,094	165	33.9
1907	512,622	185	36.1
1908	538,150	225	41.8
1909	563,678	172	30.5

Table 25
Mortality from Cancer, Utah
1910-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1910	375,389	134	35.7
1911	385,171	200	51.9
1912	394,953	188	47.6
1913	404,735	211	52.1

Table 26
Mortality from Cancer, Vermont
1900-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	343,745	302	87.9
1901	344,992	243	70.4
1902	346,239	239	69.0
1903	347,486	325	93.5
1904	348,733	303	86.9
1905	349,980	294	84.0
1906	351,227	299	85.1
1907	352,474	348	98 7
1908	353,721	325	91.9
1909	354,968	345	97.2
1910	356,216	393	110.3
1911	357,463	361	101.0
1912	358,710	396	110.4
1913	359,957	402	111.7

Table 27
Mortality from Cancer, Washington
1908-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1908	1,028,794	466	45.3
1909	1,091,973	559	51.2
1910	1,155,152	593	51.3
1911	1,218,330	562	46.1
1912	1,281,508	679	53.0
1913	1,344,686	720	53.5

Table 28
Mortality from Cancer, Wisconsin
1908-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1908	2,295,302	1,513	65.9
1909	2,316,822	1,645	71.0
1910	2,338,343	1,763	75.4
1911	2,359,863	1,763	74.7
1912	2,393,081	1,841	76.9
1913	2,419,898	1,899	78.5

Table 29
Estimated Mortality from Malignant and Benign Tumors in Continental United States
1900-1913

Year	Population Continental United States	Death Rate per 100,000 Population U.S. Reg. Area	Estimated Deaths from Malignant and Benign Tumors
1900	75,994,575	67.3	51,173
1901	77,592,344	68.9	53,459
1902	79,190,113	69.6	55,106
1903	80,787,882	73.2	59,112
1904	82,385,651	74.7	61,501
1905	83,983,420	76.0	63,794
1906	85,581,189	73.0	62,493
1907	87,178,958	75.1	65,502
1908	88,776,727	75.3	66,868
1909	90,374,496	77.5	70,075
1910	91,972,266	79.9	73,502
1911	93,570,036	77.7	72,675
1912	95,167,806	80.3	76,423
1913	96,765,576	82.2	79,567

Table 30
Estimated Mortality from Benign Tumors in Continental United States
1900-1913

Year	Population Continental United States	Death Rate per 100,000 Population U.S. Reg. Area	Estimated Deaths from Benign Tumors
1900	75,994,575	4.4	3,344
1901	77,592,344	4.6	3,569
1902	79,190,113	4.5	3,564
1903	80,787,882	4.9	3,959
1904	82,385,651	4.5	3,707
1905	83,983,420	4.6	3,863
1906	85,581,189	3.9	3,338
1907	87,178,958	4.2	3,662
1908	88,776,727	3.8	3,374
1909	90,374,496	3.7	3,344
1910	91,972,266	3.7	3,403
1911	93,570,036	3.4	3,181
1912	95,167,806	3.3	3,141
1913	96,765,576	3.4	3,248

Table 31
Mortality from Cancer, United States Registration Area
Males
1900-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	15,415,757	7,294	47.3
1901	15,742,434	7,706	49.0
1902	16,111,848	7,798	48.4
1903	16,489,113	8,422	51.1
1904	16,856,270	8,881	52.7
1905	17,274,352	9,189	53.2
1906	21,322,133	11,166	52.4
1907	21,899,144	11,800	53.9
1908	23,876,529	13,046	54.6
1909	26,020,431	14,918	57.3
1910	27,606,526	16,373	59.3
1911	30,463,411	17,525	57.5
1912	31,128,193	18,464	59.3
1913	32,681,358	20,045	61.3

Table 32
Mortality from Cancer, United States Registration Area
Females
1900-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	15,378,516	12,087	78.6
1901	15,628,518	12,465	79.8
1902	15,917,967	13,049	82.0
1903	16,211,970	13,903	85.8
1904	16,492,867	14,514	88.0
1905	16,820,253	15,141	90.0
1906	20,661,286	17,854	86.4
1907	21,117,846	18,714	88.6
1908	22,913,384	20,419	89.1
1909	24,850,087	22,644	91.1
1910	26,237,370	24,666	94.0
1911	28,812,566	26,499	92.0
1912	29,298,940	28,067	95.8
1913	30,617,806	29,883	97.6

APPENDIX F (PART I)

Table 33
Mortality from Benign Tumors
United States Registration Area
1900-1913

	All Specified Forms		Hydatid Tumor of Liver		Tumor of Uterus		Tumor of Ovaries		Tumor of Other Organs	
Year	Deaths	Rate per 100,000 Population	Deaths	Rate per 100,000 Population	Deaths	Rate per 100,000 Population	Deaths	Rate per 100,000 Population	Deaths	Rate per 100,000 Population
1900	1,343	4.4	10	0.03	403	1.3	349	1.1	581	1.9
1901	1,453	4.6	8	0.03	529	1.7	411	1.3	505	1.6
1902	1,437	4.5	14	0.04	536	1.7	428	1.3	459	1.4
1903	1,587	4.9	9	0.03	608	1.9	439	1.3	531	1.6
1904	1,509	4.5	12	0.04	620	1.9	433	1.3	444	1.3
1905	1,566	4.6	14	0.04	611	1.8	440	1.3	501	1.5
1906	1,645	3.9	13	0.03	731	1.7	431	1.0	470	1.1
1907	1,786	4.2	9	0.02	813	1.9	456	1.1	508	1.2
1908	1,770	3.8	13	0.03	845	1.8	454	1.0	458	1.0
1909	1,857	3.7	19	0.04	862	1.7	518	1.0	458	0.9
1910	2,010	3.7	24	0.04	933	1.7	500	0.9	553	1.0
1911	1,999	3.4	24	0.04	892	1.5	628	1.1	455	0.8
1912	2,001	3.3	25	0.04	1,053	1.7	546	0.9	377	0.6
1913	2,125	3.4	15	0.02	1,173	1.9	640	1.0	297	0.5

Table 34
Mortality from Benign Tumors, Males
United States Registration Area
1900-1913

	All Specified Forms		Hydatid Tumor of Liver		Tumor of Other Organs	
Year	Deaths	Rate per 100,000 Population	Deaths	Rate per 100,000 Population	Deaths	Rate per 100,000 Population
1900	165	1.1	8	0.05	157	1.0
1901	154	1.0	3	0.02	151	1.0
1902	129	0.8	6	0.04	123	0.8
1903	158	1.0	6	0.04	152	0.9
1904	120	0.7	7	0.04	113	0.7
1905	148	0.9	11	0.06	137	0.8
1906	124	0.6	9	0.04	115	0.5
1907	146	0.7	6	0.03	140	0.6
1908	122	0.5	5	0.02	117	0.5
1909	136	0.5	8	0.03	128	0.5
1910	162	0.6	20	0.07	142	0.5
1911	127	0.4	11	0.04	116	0.4
1912	109	0.4	13	0.04	96	0.3
1913	97	0.3	9	0.03	88	0.3

APPENDIX F (PART I)

Table 35
Mortality from Benign Tumors, Females
United States Registration Area
1900-1913

All Specified Forms		Hydatid Tumor of Liver		Tumor of Uterus		Tumor of Ovaries		Tumor of Other Organs	
Deaths	Rate per 100,000 Population	Deaths	Rate per 100,000 Population	Deaths	Rate per 100,000 Population	Deaths	Rate per 100,000 Population	Deaths	Rate per 100,000 Population
1,178	7.7	2	0.01	403	2.6	349	2.3	424	2.8
1,299	8.3	5	0.03	529	3.4	411	2.6	354	2.3
1,308	8.2	8	0.05	536	3.4	428	2.7	336	2.1
1,429	8.8	3	0.02	608	3.8	439	2.7	379	2.3
1,389	8.4	5	0.03	620	3.8	433	2.6	331	2.0
1,418	8.4	3	0.02	611	3.6	440	2.6	364	2.2
1,521	7.4	4	0.02	731	3.5	431	2.1	355	1.7
1,640	7.8	3	0.01	813	3.8	456	2.2	368	1.7
1,648	7.2	8	0.03	845	3.7	454	2.0	341	1.5
1,721	6.9	11	0.04	862	3.5	518	2.1	330	1.3
1,848	7.0	4	0.02	933	3.6	500	1.9	411	1.6
1,872	6.5	13	0.05	892	3.1	628	2.2	339	1.2
1,892	6.5	12	0.04	1,053	3.6	546	1.9	281	1.0
2,028	6.6	6	0.02	1,173	3.8	640	2.1	209	0.7

Table 36
Mortality from Ulcer of the Stomach, by Sex
United States Registration Area
1900-1913

Total		Males		Females	
Deaths	Rate per 100,000 Population	Deaths	Rate per 100,000 Population	Deaths	Rate per 100,000 Population
804	2.6	419	2.7	385	2.5
871	2.8	439	2.8	432	2.8
905	2.8	465	2.9	440	2.8
905	2.8	465	2.8	440	2.7
1,044	3.1	524	3.1	520	3.2
1,094	3.2	615	3.6	479	2.8
1,423	3.4	731	3.4	692	3.3
1,481	3.4	802	3.7	679	3.2
1,523	3.3	866	3.6	657	2.9
1,770	3.5	1,009	3.9	761	3.1
2,203	4.1	1,273	4.6	930	3.5
2,143	3.6	1,222	4.0	921	3.2
2,316	3.8	1,398	4.5	918	3.1
2,536	4.0	1,483	4.5	1,053	3.4

Table 37
Mortality from Biliary Calculi, by Sex United States Registration Area 1900-1913

	Total		Males		Females	
Year	Deaths	Rate per 100,000 Population	Deaths	Rate per 100,000 Population	Deaths	Rate per 100,000 Population
1900	459	1.5	149	1.0	310	2.0
1901	500	1.6	145	0.9	355	2.3
1902	668	2.1	219	1.4	449	2.8
1903	795	2.4	235	1.4	560	3.5
1904	832	2.5	264	1.6	568	3.4
1905	883	2.6	263	1.5	620	3.7
1906	1,134	2.7	338	1.6	796	3.9
1907	1,110	2.6	343	1.6	767	3.6
1908	1,275	2.7	377	1.6	898	3.9
1909	1,486	2.9	447	1.7	1,039	4.2
1910	1,501	2.8	461	1.7	1,040	4.0
1911	1,749	3.0	510	1.7	1,239	4.3
1912	1,793	3.0	529	1.7	1,264	4.3
1913	1,999	3.2	595	1.8	1,404	4.6

Table 38
Mortality from Calculi of the Urinary Tract, by Sex United States Registration Area 1900-1913

	Total		Males		Females	
Year	Deaths	Rate per 100,000 Population	Deaths	Rate per 100,000 Population	Deaths	Rate per 100,000 Population
1900	116	0.4	82	0.5	34	0.2
1901	126	0.4	95	0.6	31	0.2
1902	150	0.5	118	0.7	32	0.2
1903	151	0.5	113	0.7	38	0.2
1904	154	0.5	121	0.7	33	0.2
1905	193	0.6	141	0.8	52	0.3
1906	227	0.5	170	0.8	57	0.3
1907	229	0.5	163	0.7	66	0.3
1908	250	0.5	175	0.7	75	0.3
1909	292	0.6	218	0.8	74	0.3
1910	329	0.6	241	0.9	88	0.3
1911	361	0.6	260	0.9	101	0.4
1912	358	0.6	247	0.8	111	0.4
1913	403	0.6	291	0.9	112	0.4

APPENDIX F (PART 1)

Table 39

Comparative Mortality from Cancer, by Race, United States Registration Area, 1910-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
WHITE			
1910	51,690,975	39,875	77.1
1911	56,763,765	42,593	75.0
1912	57,874,275	45,076	77.9
1910–1912	166,329,015	127,544	76.7
COLORED			
1910	2,152,921	1,164	54.1
1911	2,512,212	1,431	57.0
1912	2,552,858	1,455	57.0
1910–1912	7,217,991	4,050	56.1

Table 40

Comparative Urban and Rural Mortality from Cancer, United States Registration States, 1900-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
URBAN			
1900	10,675,611	7,060	66.1
1901	11,188,101	7,717	69.0
1902	11,477,929	7,844	68.3
1903	11,754,911	8,498	72.3
1904	12,029,302	8,892	73.9
1905	12,372,228	9,323	75.4
1906	18,195,041	13,871	76.2
1907	18,737,525	14,536	77.6
1908	20,417,270	15,754	77.2
1909	23,066,405	18,486	80.1
1910	25,187,805	20,505	81.4
1911	27,485,457	22,515	81.9
1912	28,129,824	23,882	84.9
1913	29,244,160	25,672	87.8
RURAL			
1900	9,289,538	5,709	61.5
1901	9,118,942	5,721	62.7
1902	9,171,012	5,809	63.3
1903	9,235,930	6,152	66.6
1904	9,307,413	6,355	68.3
1905	9,364,680	6,660	71.1
1906	15,640,988	9,528	60.9
1907	15,871,371	10,130	63.8
1908	18,288,591	11,863	64.9
1909	21,215,280	14,237	67.1
1910	22,619,961	15,859	70.1
1911	26,899,777	17,714	65.9
1912	27,122,299	18,582	68.5
1913	29,068,435	20,161	69.4

29

APPENDIX F (PART I)

Table 41
Mortality from Cancer of the Buccal Cavity, by Sex
United States Registration Area
1900-1913

Year	Total		Males		Females	
	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population
1900	495	1.6	377	2.4	118	0.8
1901	612	2.0	496	3.2	116	0.7
1902	583	1.8	461	2.9	122	0.8
1903	661	2.0	527	3.2	134	0.8
1904	737	2.2	591	3.5	146	0.9
1905	792	2.3	643	3.7	149	0.9
1906	941	2.2	762	3.6	179	0.9
1907	968	2.3	788	3.6	180	0.9
1908	1,148	2.5	950	4.0	198	0.9
1909	1,427	2.8	1,195	4.6	232	0.9
1910	1,576	2.9	1,329	4.8	247	0.9
1911	1,727	2.9	1,402	4.6	325	1.1
1912	1,838	3.0	1,465	4.7	373	1.3
1913	1,966	3.1	1,628	5.0	338	1.1

Table 42
Mortality from Cancer of the Stomach and Liver, by Sex
United States Registration Area
1900-1913

Year	Total		Males		Females	
	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population
1900	6,918	22.5	3,418	22.2	3,500	22.8
1901	7,095	22.6	3,594	22.8	3,501	22.4
1902	7,483	23.4	3,681	22.8	3,802	23.9
1903	8,193	25.1	4,037	24.5	4,156	25.6
1904	8,744	26.2	4,340	25.7	4,404	26.7
1905	8,939	26.2	4,388	25.4	4,551	27.1
1906	10,946	26.1	5,443	25.5	5,503	26.6
1907	11,596	27.0	5,779	26.4	5,817	27.5
1908	13,044	27.9	6,537	27.4	6,507	28.4
1909	14,915	29.3	7,477	28.7	7,438	29.9
1910	16,475	30.6	8,135	29.5	8,340	31.8
1911	17,365	29.3	8,698	28.6	8,667	30.1
1912	18,517	30.6	9,215	29.6	9,302	31.7
1913	19,767	31.2	9,749	29.8	10,018	32.7

Table 43

ality from Cancer of the Peritoneum, Intestines and Rectum, by Sex
United States Registration Area
1900-1913

Total		Males		Females	
Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population
1,760	5.7	792	5.1	968	6.3
2,157	6.9	935	5.9	1,222	7.8
2,239	7.0	1,014	6.3	1,225	7.7
2,134	6.5	899	5.5	1,235	7.6
2,399	7.2	1,054	6.3	1,345	8.2
2,732	8.0	1,129	6.5	1,603	9.5
3,273	7.8	1,320	6.2	1,953	9.5
3,570	8.3	1,497	6.8	2,073	9.8
3,963	8.5	1,649	6.9	2,314	10.1
4,676	9.2	1,961	7.5	2,715	10.9
5,258	9.8	2,183	7.9	3,075	11.7
5,824	9.8	2,464	8.1	3,360	11.7
5,923	9.8	2,459	7.9	3,464	11.8
6,625	10.5	2,811	8.6	3,814	12.5

Table 44

ality from Cancer of the Female Generative Organs and Female Breast
United States Registration Area
1900-1913

Female Generative Organs			Female Breast		
Deaths from Cancer	Rate per 100,000 Total Population	Rate per 100,000 Female Population	Deaths from Cancer	Rate per 100,000 Total Population	Rate per 100,000 Female Population
2,696	8.8	17.5	1,400	4.5	9.1
2,919	9.3	18.7	1,621	5.2	10.4
3,033	9.5	19.1	1,734	5.4	10.9
3,289	10.1	20.3	1,777	5.4	11.0
3,436	10.3	20.8	2,019	6.1	12.2
3,637	10.7	21.6	1,994	5.8	11.9
4,090	9.7	19.8	2,421	5.8	11.7
4,388	10.2	20.8	2,590	6.0	12.3
5,250	11.2	22.9	3,023	6.5	13.2
5,714	11.2	23.0	3,585	7.0	14.4
6,147	11.4	23.4	3,730	6.9	14.2
6,707	11.3	23.3	4,190	7.1	14.5
7,089	11.7	24.2	4,356	7.2	14.9
7,706	12.2	25.2	4 514	7.1	14.7

APPENDIX F (PART I)

Table 45

Mortality from Cancer of the Skin, by Sex
United States Registration Area
1900-1913

	Total		Males		Females	
Year	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population
1900	602	2.0	392	2.5	210	1.4
1901	683	2.2	456	2.9	227	1.5
1902	688	2.1	454	2.8	234	1.5
1903	752	2.3	484	2.9	268	1.7
1904	758	2.3	462	2.7	296	1.8
1905	818	2.4	539	3.1	279	1.7
1906	984	2.3	656	3.1	328	1.6
1907	1,121	2.6	724	3.3	397	1.9
1908	1,282	2.7	827	3.5	455	2.0
1909	1,492	2.9	988	3.8	504	2.0
1910	1,459	2.7	952	3.4	507	1.9
1911	1,619	2.7	1,011	3.3	608	2.1
1912	1,743	2.9	1,079	3.5	664	2.3
1913	1,725	2.7	1,128	3.5	597	1.9

Table 46

Mortality from Cancer of Other or Not Specified Organs and Parts, by Sex
United States Registration Area
1900-1913

	Total		Males		Females	
Year	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population
1900	5,510	17.9	2,315	15.0	3,195	20.8
1901	5,084	16.2	2,225	14.1	2,859	18.3
1902	5,087	15.9	2,188	13.6	2,899	18.2
1903	5,519	16.9	2,475	15.0	3,044	18.8
1904	5,302	15.9	2,434	14.4	2,868	17.4
1905	5,418	15.9	2,490	14.4	2,928	17.4
1906	6,365	15.2	2,985	14.0	3,380	16.4
1907	6,281	14.6	3,012	13.8	3,269	15.5
1908	5,755	12.3	3,083	12.9	2,672	11.7
1909	5,753	11.3	3,297	12.7	2,456	9.9
1910	6,394	11.9	3,774	13.7	2,620	10.0
1911	6,592	11.1	3,950	13.0	2,642	9.2
1912	7,065	11.7	4,246	13.6	2,819	9.6
1913	7,625	12.0	4,729	14.5	2,896	9.5

APPENDIX F (PART I)

Table 47
Estimated Total Mortality from Cancer, by Organs and Parts Continental United States 1900-1913

Buccal Cavity	Stomach and Liver	Peritoneum Intestines and Rectum	Female Generative Organs	Female Breast	Skin	Other Organs or Parts
1,224	17,072	4,343	6,653	3,455	1,485	13,597
1,513	17,548	5,334	7,219	4,009	1,689	12,578
1,444	18,500	5,535	7,499	4,287	1,700	12,577
1,632	20,241	5,271	8,125	4,391	1,857	13,636
1,820	21,601	5,926	8,488	4,988	1,872	13,099
1,950	22,019	6,730	8,959	4,911	2,015	13,347
1,918	22,313	6,671	8,336	4,935	2,005	12,977
1,962	23,500	7,235	8,892	5,248	2,271	12,732
2,178	24,748	7,519	9,961	5,735	2,432	10,921
2,535	26,497	8,306	10,151	6,369	2,650	10,223
2,691	28,141	8,981	10,500	6,371	2,492	10,923
2,726	27,411	9,193	10,587	6,614	2,555	10,408
2,894	29,162	9,327	11,164	6,860	2,745	11,130
3,007	30,215	10,128	11,776	7,021	2,633	11,539

Table 48
pulation Statistics,* by Age and Sex, United States Registration Area 1903-1912

	1903-1912		1903-1907		1908-1912	
es	Males	Females	Males	Females	Males	Females
r 10	46,012,661	45,163,577	18,792,745	18,479,974	27,219,916	26,083,603
)-24	64,758,033	64,826,435	25,939,027	26,470,105	38,819,006	38,356,330
5-34	41,612,738	38,391,104	16,873,725	15,923,152	24,739,013	22,467,952
5-44	33,235,346	30,097,450	13,479,733	12,267,433	19,755,613	17,830,017
5-54	23,174,947	20,941,618	9,164,393	8,424,322	14,010,554	12,517,296
5-64	13,726,350	13,042,548	5,478,304	5,341,009	8,248,046	7,701,539
5-74	7,452,085	7,602,607	2,945,685	3,061,414	4,506,400	4,541,193
d over	2,963,942	3,351,230	1,167,400	1,336,813	1,796,542	2,014,417
ges	232,936,102	223,416,569	93,841,012	91,304,222	139,095,090	132,112,347
d over	47,317,324	44,938,003	18,755,782	18,163,558	28,561,542	26,774,445

idyear estimates.

APPENDIX F (PART I)

Table 49
Mortality from Cancer of All Organs and Parts, by Age and Sex
United States Registration Area
1903-1912

Ages at Death	Males: Deaths from Cancer	Males: Rate per 100,000 Population	Females: Deaths from Cancer	Females: Rate per 100,000 Population	Comparison of Rate Differences: Actual	Comparison of Rate Differences: Per Cent
Under 10	1,170	2.5	984	2.2	− 0.3	12.0
10–24	2,028	3.1	1,844	2.8	− 0.3	9.7
25–34	3,757	9.0	7,891	20.6	+ 11.6	128.9
35–44	10,750	32.3	26,779	89.0	+ 56.7	175.5
45–54	24,431	105.4	46,669	222.9	+117.5	111.5
55–64	35,327	257.4	50,393	386.4	+129.0	50.1
65–74	33,745	452.8	43,010	565.7	+112.9	24.9
75 and over	18,381	620.2	24,601	734.1	+113.9	18.4
All ages*	129,784	55.7	202,421	90.6	+ 34.9	62.7
45 and over	111,884	236.5	164,673	366.4	+129.9	54.9

*Including unknown ages.

Table 50
Mortality from Cancer of the Buccal Cavity, by Age and Sex
United States Registration Area
1903-1912

Ages at Death	Males: Deaths from Cancer	Males: Rate per 100,000 Population	Females: Deaths from Cancer	Females: Rate per 100,000 Population	Comparison of Rate Differences: Actual	Comparison of Rate Differences: Per Cent
Under 10	58	0.1	45	0.1	..	..
10–24	79	0.1	49	0.1	..	..
25–34	131	0.3	58	0.2	− 0.1	33.3
35–44	640	1.9	135	0.4	− 1.5	78.9
45–54	1,829	7.9	303	1.4	− 6.5	82.3
55–64	2,605	19.0	467	3.6	−15.4	81.1
65–74	2,565	34.4	565	7.4	−27.0	78.5
75 and over	1,732	58.4	538	16.1	−42.3	72.4
All ages*	9,652	4.2	2,163	1.0	− 3.2	76.2
45 and over	8,731	18.5	1,873	4.1	−14.4	77.8

*Including unknown ages.

APPENDIX F (PART I)

Table 51
Mortality from Cancer of the Stomach and Liver, by Age and Sex United States Registration Area 1903-1912

Ages at Death	Males: Deaths from Cancer	Males: Rate per 100,000 Population	Females: Deaths from Cancer	Females: Rate per 100,000 Population	Comparison of Rate Differences: Actual	Comparison of Rate Differences: Per Cent.
Under 10	163	0.3	119	0.2	− 0.1	33.3
10–24	299	0.5	256	0.4	− 0.1	20.0
25–34	1,267	3.1	1,484	3.9	+ 0.8	25.8
35–44	5,224	15.7	5,753	19.1	+ 3.4	21.7
45–54	13,110	56.6	12,798	61.1	+ 4.5	8.0
55–64	19,057	138.8	17,805	136.5	− 2.3	1.7
65–74	17,273	231.8	17,496	230.1	− 1.7	0.7
75 and over	7,569	255.4	8,911	265.9	+10.5	4.1
All ages*	64,049	27.5	64,685	29.0	+ 1.5	5.5
45 and over	57,009	120.5	57,010	126.9	+ 6.4	5.3

*Including unknown ages.

Table 52
Mortality from Cancer of the Peritoneum, Intestines and Rectum by Age and Sex, United States Registration Area 1903-1912

Ages at Death	Males: Deaths from Cancer	Males: Rate per 100,000 Population	Females: Deaths from Cancer	Females: Rate per 100,000 Population	Comparison of Rate Differences: Actual	Comparison of Rate Differences: Per Cent.
Under 10	127	0.3	79	0.2	− 0.1	33.3
10–24	349	0.5	246	0.4	− 0.1	20.0
25–34	808	1.9	929	2.4	+ 0.5	26.3
35–44	1,636	4.9	2,632	8.8	+ 3.9	79.6
45–54	3,130	13.5	4,684	22.4	+ 8.9	65.9
55–64	4,523	33.0	5,851	44.9	+11.9	36.1
65–74	4,135	55.5	5,606	73.7	+18.2	32.8
75 and over	1,888	63.7	3,081	91.9	+28.2	44.3
All ages*	16,615	7.1	23,137	10.3	+ 3.2	45.1
45 and over	13,676	28.9	19,222	42.8	+13.9	48.1

*Including unknown ages.

Table 53

Mortality from Cancer of the Female Generative Organs and Female Breast, by Age, United States Registration Area 1903-1912

Ages at Death	Female Generative Organs: Deaths from Cancer	Female Generative Organs: Rate per 100,000 Female Population	Female Breast: Deaths from Cancer	Female Breast: Rate per 100,000 Female Population
Under 10	31	0.1	8	0.0
10–24	370	0.6	49	0.1
25–34	2,989	7.8	918	2.4
35–44	9,820	32.6	4,583	15.2
45–54	14,900	71.2	7,528	35.9
55–64	11,920	91.4	7,046	54.0
65–74	6,903	90.8	5,683	74.8
75 and over	2,756	82.2	3,836	114.5
All ages*	49,747	22.3	29,685	13.3
45 and over	36,479	81.2	24,093	53.6

*Including unknown ages.

Table 54

Mortality from Cancer of the Skin, by Age and Sex United States Registration Area 1903-1912

Ages at Death	Males: Deaths from Cancer	Males: Rate per 100,000 Population	Females: Deaths from Cancer	Females: Rate per 100,000 Population	Comparison of Rate Differences: Actual	Comparison of Rate Differences: Per Cent
Under 10	42	0.1	39	0.1	..	..
10–24	63	0.1	41	0.1	..	..
25–34	88	0.2	55	0.1	− 0.1	50.0
35–44	359	1.1	169	0.6	− 0.5	45.5
45–54	913	3.9	391	1.9	− 2.0	51.3
55–64	1,559	11.4	657	5.0	− 6.4	56.1
65–74	2,138	28.7	1,064	14.0	−14.7	51.2
75 and over	2,544	85.9	1,880	56.1	−29.8	34.7
All ages*	7,722	3.3	4,306	1.9	− 1.4	42.4
45 and over	7,154	15.1	3,992	8.9	− 6.2	41.1

*Including unknown ages.

APPENDIX F (PART I)

Table 55

Mortality from Cancer of Other or Not Specified Organs and Parts,* by Age and Sex, United States Registration Area

1903-1912

Ages at Death	Males: Deaths from Cancer	Males: Rate per 100,000 Population	Females: Deaths from Cancer	Females: Rate per 100,000 Population	Comparison of Rate Differences: Actual	Comparison of Rate Differences: Per Cent.
Under 10	780	1.7	663	1.5	− 0.2	11.8
10–24	1,238	1.9	833	1.3	− 0.6	31.6
25–34	1,463	3.5	1,458	3.8	+ 0.3	8.6
35–44	2,891	8.7	3,687	12.3	+ 3.6	41.4
45–54	5,449	23.5	6,065	29.0	+ 5.5	23.4
55–64	7,583	55.2	6,647	51.0	− 4.2	7.6
65–74	7,634	102.4	5,693	74.9	−27.5	26.9
75 and over	4,648	156.8	3,599	107.4	−49.4	31.5
All ages†	31,746	13.6	28,698	12.8	− 0.8	5.9
45 and over	25,314	53.5	22,004	48.9	− 4.6	8.6

*Including cancer of the male breast.
†Including unknown ages.

Table 56

Mortality from Cancer, Urban and Rural, by Organs and Parts United States Registration States

1908-1912

Organ or Part	Deaths from Cancer	Rate per 100,000 Population	Cancer Per Cent.
URBAN			
Buccal cavity	3,627	2.9	3.6
Stomach and liver	38,869	31.3	38.4
Peritoneum, intestines and rectum	13,888	11.2	13.7
Female generative organs	16,377	13.2	16.2
Breast	9,499	7.6	9.4
Skin	2,659	2.1	2.6
Other or not specified organs	16,223	13.0	16.1
All organs	101,142	81.3	100.0
RURAL			
Buccal cavity	3,226	2.8	4.1
Stomach and liver	32,518	28.0	41.6
Peritoneum, intestines and rectum	9,165	7.9	11.7
Female generative organs	10,158	8.7	13.0
Breast	7,689	6.6	9.8
Skin	4,205	3.6	5.4
Other or not specified organs	11,294	9.7	14.4
All organs	78,255	67.3	100.0

APPENDIX F (PART I)

Table 57
Proportionate Mortality from Cancer, by Age and Sex United States Registration Area 1908-1912

	MALES			FEMALES		
Ages at Death	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
Under 5	559,943	489	0.1	457,896	436	0.1
5– 9	44,712	226	0.5	40,581	167	0.4
10–14	29,619	195	0.7	27,239	176	0.6
15–19	50,540	361	0.7	47,012	334	0.7
20–24	79,135	632	0.8	68,824	581	0.8
25–29	86,620	928	1.1	72,500	1,451	2.0
30–34	89,576	1,302	1.5	70,275	3,138	4.5
35–39	101,203	2,409	2.4	75,101	6,151	8.2
40–44	102,469	3,844	3.8	71,142	9,560	13.4
45–49	109,083	6,198	5.7	74,773	12,841	17.2
50–54	118,046	8,724	7.4	83,094	15,040	18.1
55–59	116,007	10,237	8.8	86,075	14,990	17.4
60–64	127,186	11,627	9.1	101,475	15,207	15.0
65–69	133,478	11,546	8.7	115,105	14,513	12.6
70–74	129,176	9,611	7.4	118,788	11,938	10.0
75–79	114,101	6,878	6.0	110,598	8,700	7.9
80–84	78,996	3,381	4.3	84,061	4,496	5.3
85–89	40,663	1,305	3.2	47,809	1,888	3.9
90–94	12,801	299	2.3	17,635	497	2.8
95 and over	3,362	62	1.8	5,458	104	1.9
Unknown	3,555	72	..	1,347	87	..
All ages	2,130,271	80,326	3.8	1,776,788	122,295	6.9
Under 15	634,274	910	0.1	525,716	779	0.1
15–44	509,543	9,476	1.9	404,854	21,215	5.2
45–64	470,322	36,786	7.8	345,417	58,078	16.8
65 and over	512,577	33,082	6.5	499,454	42,136	8.4

Table 58
Relative Mortality from Cancer and Other Important Causes of Death by Age and Sex, United States Registration Area 1908-1912

	TOTAL				
	ALL AGES*	UNDER 45		45 AND OVER	
	Deaths	Deaths	Per Cent. of All Known Ages	Deaths	Per Cent. of All Known Ages
All Causes...........	3,907,059	2,074,387	53.2	1,827,770	46.8
Typhoid fever.......	57,208	47,611	83.4	9,497	16.6
Pul. tuberculosis.....	366,075	267,167	73.1	98,521	26.9
Cancer..............	202,621	32,380	16.0	170,082	84.0
Apoplexy...........	198,657	17,752	8.9	180,698	91.1
Heart diseases.......	421,580	87,093	20.7	334,073	79.3
Pneumonia..........	369,966	222,493	60.2	147,213	39.8
Digestive diseases....	480,614	352,730	73.4	127,696	26.6
Nephritis............	265,665	63,852	24.1	201,590	75.9
Suicides............	44,602	24,507	55.2	19,911	44.8
Accidents...........	224,061	145,328	65.3	77,392	34.7

*Including unknown ages.

Table 58 (concluded)

Mortality from Cancer and Other Important Causes of Death by Age and Sex, United States Registration Area 1908-1912

	All Ages*	Under 45		45 and Over	
	Deaths	Deaths	Per Cent. of All Known Ages	Deaths	Per Cent. of All Known Ages
	MALES				
....	2,130,271	1,143,817	53.8	982,899	46.2
fever	34,206	28,444	83.3	5,694	16.7
rculosis.....	207,603	143,593	69.2	63,791	30.8
....	80,326	10,386	12.9	69,868	87.1
....	101,751	9,771	9.6	91,846	90.4
eases.......	223,934	44,023	19.7	179,656	80.3
ia..........	203,946	127,156	62.4	76,637	37.6
diseases....	257,919	191,583	74.3	66,221	25.7
....	149,535	33,251	22.3	116,142	77.7
....	34,348	17,512	51.2	16,666	48.8
....	173,457	117,604	68.3	54,588	31.7
	FEMALES				
....	1,776,788	930,570	52.4	844,871	47.6
ever	23,002	19,167	83.4	3,803	16.6
rculosis.....	158,472	123,574	78.1	34,730	21.9
....	122,295	21,994	18.0	100,214	82.0
....	96,906	7,981	8.2	88,852	91.8
eases.......	197,646	43,070	21.8	154,417	78.2
ia..........	166,020	95,337	57.5	70,576	42.5
diseases....	222,695	161,147	72.4	61,475	27.6
....	116,130	30,601	26.4	85,448	73.6
....	10,254	6,995	68.3	3,245	31.7
....	50,604	27,724	54.9	22,804	45.1

g unknown ages.

Table 59

y from Cancer in the States of New York, Massachusetts, New Hampshire and Connecticut, by Months 1902-1911

	Mean Population*	Deaths from Cancer	Rate per 100,000 Population	Months	Mean Population*	Deaths from Cancer	Rate per 100,000 Population
...	131,540,322	8,300	6.3	August.....	133,360,781	8,941	6.7
....	120,069,048	7,721	6.4	September..	129,300,297	8,543	6.6
...	132,048,497	8,600	6.5	October....	133,883,987	9,017	6.7
...	128,030,367	8,315	6.5	November..	129,806,603	8,477	6.5
...	132,571,692	8,576	6.5	December..	134,407,183	8,804	6.6
...	128,540,835	8,123	6.3	Monthly			
...	133,094,888	8,613	6.5	Average ...	130,554,542	8,503	6.5

ion has been standardized for variation in length of month.

APPENDIX F (PART I)

Table 60

Comparative Death Rate from Cancer, 1901 and 1911, according to Age and Sex, in the States Included in the Registration Area in 1900*

Rate per 100,000 Population

Age Period	Total 1901	Total 1911	Per Cent. Which Rate in 1911 Represents of That in 1901
All ages:			
Crude rate.....	65.8	83.9	128
Standardized rate†	62.2	77.6	125
Under 5 years....	3.4	3.0	88
5– 9 years....	1.0	1.2	120
10–14 "	0.9	1.3	144
15–19 "	2.1	2.3	110
20–24 "	3.9	4.8	123
25–34 "	13.4	13.9	104
35–44 "	60.2	61.0	101
45–54 "	146.5	166.3	114
55–64 "	268.3	352.4	131
65–74 "	418.8	566.7	135
75 and over......	557.6	794.7	143
25 years and over:			
Crude rate.......	124.5	155.7	125
Standardized rate†	127.2	159.0	125

Age Period	Males 1901	Males 1911	Per Cent. Which Rate in 1911 Represents of That in 1901	Age Period	Females 1901	Females 1911	Per Cent. Which Rate in 1911 Represents of That in 1901
All ages:				All ages:			
Crude rate.....	48.7	64.2	132	Crude rate....	83.0	104.0	125
Stand'r'zed rate†	43.6	56.7	130	Stand'r'zed rate†	79.7	97.2	122
Under 5 years..	3.8	3.1	82	Under 5 years..	3.1	3.0	97
5– 9 years..	1.3	1.3	100	5– 9 years..	0.8	1.1	138
10–14 " ..	0.9	1.0	111	10–14 " ..	0.9	1.5	167
15–19 " ..	1.9	2.9	153	15–19 " ..	2.2	1.7	77
20–24 " ..	3.3	4.9	148	20–24 " ..	4.5	4.6	102
25–34 " ..	9.4	8.7	93	25–34 " ..	17.5	19.4	111
35–44 " ..	32.5	31.1	96	35–44 " ..	89.6	92.5	103
45–54 " ..	90.0	109.2	121	45–54 " ..	205.4	227.0	111
55–64 " ..	203.8	283.4	139	55–64 " ..	331.8	422.3	127
65–74 " ..	366.0	512.8	140	65–74 " ..	468.9	617.8	132
75 and over....	520.8	730.5	140	75 and over....	589.8	848.7	144
25 years and over:				25 years and over:			
Crude rate.....	90.9	117.7	129	Crude rate.....	158.7	195.0	123
Stand'r'zed rate†	90.4	117.9	130	Stand'r'zed rate†	160.3	195.9	122

*Includes Connecticut, the District of Columbia, Indiana, Maine, Massachusetts, Michigan, New Hampshire, New Jersey, New York, Rhode Island and Vermont.

†Standardized on basis of standard million of England and Wales, 1901.

APPENDIX F (PART I)

Table 61

tality from Cancer of All Organs and Parts, according to Age
United States Registration Area
1903-1907 Compared with 1908-1912
Males

	1903-1907		1908-1912		Increase or Decrease	
ath	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population	Actual	Per Cent.
)	455	2.4	715	2.6	+ 0.2	8.3
ı	840	3.2	1,188	3.1	− 0.1	3.1
ı	1,527	9.0	2,230	9.0	..	..
ı	4,497	33.4	6,253	31.7	− 1.7	5.1
ı	9,509	103.8	14,922	106.5	+ 2.7	2.6
ı	13,463	245.7	21,864	265.1	+ 19.4	7.9
ı	12,588	427.4	21,157	469.5	+ 42.1	9.9
ver	6,466	553.9	11,915	663.2	+109.3	19.7
	49,458	52.7	80,326	57.7	+ 5.0	9.5
ver	42,026	224.1	69,858	244.6	+ 20.5	9.1

ng unknown ages.

Table 62

ortality from Cancer of All Organs and Parts, according to Age
United States Registration Area
1903-1907 Compared with 1908-1912
Females

	1903-1907		1908-1912		Increase or Decrease	
ath	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population	Actual	Per Cent.
)	381	2.1	603	2.3	+ 0.2	9.5
ı	753	2.8	1,091	2.9	+ 0.1	3.6
ı	3,302	20.7	4,589	20.4	− 0.3	1.4
ı	11,068	90.2	15,711	88.1	− 2.1	2.3
ı	18,788	223.0	27,881	222.7	− 0.3	0.1
ı	20,196	378.1	30,197	392.1	+ 14.0	3.7
ı	16,559	540.9	26,451	582.5	+ 41.6	7.7
ver	8,916	667.0	15,685	778.6	+111.6	16.7
	80,126	87.8	122,295	92.6	+ 4.8	5.5
ver	64,459	354.9	100,214	374.3	+ 19.4	5.5

ng unknown ages.

APPENDIX F (PART I)

Table 63

Mortality from Cancer of the Buccal Cavity, according to Age United States Registration Area 1903-1907 Compared with 1908-1912 Males

	1903-1907		1908-1912		Increase or Decrease	
Ages at Death	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population	Actual	Per Cent.
Under 10	18	0.1	40	0.1	+ 0.05	50.0
10–24	33	0.1	46	0.1	− 0.01	7.7
25–34	54	0.3	77	0.3	− 0.01	3.1
35–44	261	1.9	379	1.9	− 0.02	1.0
45–54	649	7.1	1,180	8.4	+ 1.34	18.9
55–64	908	16.6	1,697	20.6	+ 4.00	24.1
65–74	865	29.4	1,700	37.7	+ 8.36	28.5
75 and over	516	44.2	1,216	67.7	+23.49	53.1
All ages*	3,311	3.5	6,341	4.6	+ 1.03	29.2
45 and over	2,938	15.7	5,793	20.3	+ 4.62	29.5

*Including unknown ages.

Table 64

Mortality from Cancer of the Buccal Cavity, according to Age United States Registration Area 1903-1907 Compared with 1908-1912 Females

	1903-1907		1908-1912		Increase or Decrease	
Ages at Death	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population	Actual	Per Cent.
Under 10	19	0.1	26	0.1	..	..
10–24	11	0.0	38	0.1	+0.06	150.0
25–34	25	0.1	33	0.1	−0.01	6.3
35–44	54	0.4	81	0.4	+0.01	2.3
45–54	121	1.4	182	1.4	+0.01	0.7
55–64	195	3.6	272	3.5	−0.12	3.3
65–74	207	6.8	358	7.9	+1.12	16.6
75 and over	156	11.7	382	19.0	+7.29	62.5
All ages*	788	0.9	1,375	1.0	+0.18	20.9
45 and over	679	3.7	1,194	4.5	+0.72	19.3

*Including unknown ages.

APPENDIX F (PART I)

Table 65

·tality from Cancer of the Stomach and Liver, according to Age
United States Registration Area
1903-1907 Compared with 1908-1912
Males

	1903-1907		1908-1912		INCREASE OR DECREASE	
ath	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population	Actual	Per Cent.
	65	0.3	98	0.4	+ 0.1	33.3
	120	0.5	179	0.5	..	..
	509	3.0	758	3.1	+ 0.1	3.3
	2,185	16.2	3,039	15.4	− 0.8	4.9
	5,046	55.1	8,064	57.6	+ 2.5	4.5
	7,096	129.5	11,961	145.0	+15.5	12.0
	6,350	215.6	10,923	242.4	+26.8	12.4
·er	2,558	219.1	5,011	278.9	+59.8	27.3
	23,987	25.6	40,062	28.8	+ 3.2	12.5
·er	21,050	112.2	35,959	125.9	+13.7	12.2

ıg unknown ages.

Table 66

·tality from Cancer of the Stomach and Liver, according to Age
United States Registration Area
1903-1907 Compared with 1908-1912
Females

	1903-1907		1908-1912		INCREASE OR DECREASE	
ath	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population	Actual	Per Cent.
	46	0.3	73	0.3	..	..
	107	0.4	149	0.4	..	..
	619	3.9	865	3.8	− 0.1	2.6
	2,346	19.1	3,407	19.1	..	..
	4,989	59.2	7,809	62.4	+ 3.2	5.4
	6,727	125.9	11,078	143.9	+18.0	14.3
	6,488	211.9	11,008	242.4	+30.5	14.4
·er	3,069	229.6	5,842	290.0	+60.4	26.3
	24,431	26.8	40,254	30.5	+ 3.7	13.8
ver	21,273	117.1	35,737	133.5	+16.4	14.0

ng unknown ages.

APPENDIX F (PART I)

Table 67

Mortality from Cancer of the Peritoneum, Intestines and Rectum according to Age, United States Registration Area 1903-1907 Compared with 1908-1912 Males

	1903-1907		1908-1912		Increase or Decrease	
Ages at Death	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population	Actual	Per Cent
Under 10	47	0.3	80	0.3	..	..
10–24	141	0.5	208	0.6	+ 0.1	20.0
25–34	308	1.8	500	2.0	+ 0.2	11.1
35–44	615	4.6	1,021	5.2	+ 0.6	13.0
45–54	1,149	12.5	1,981	14.1	+ 1.6	12.8
55–64	1,617	29.5	2,906	35.2	+ 5.7	19.3
65–74	1,408	47.8	2,727	60.5	+12.7	26.6
75 and over	613	52.5	1,275	71.0	+18.5	35.2
All ages*	5,899	6.3	10,716	7.7	+ 1.4	22.2
45 and over	4,787	25.5	8,889	31.1	+ 5.6	22.0

*Including unknown ages.

Table 68

Mortality from Cancer of the Peritoneum, Intestines and Rectum according to Age, United States Registration Area 1903-1907 Compared with 1908-1912 Females

	1903-1907		1908-1912		Increase or Decrease	
Ages at Death	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population	Actual	Per Cent.
Under 10	28	0.2	51	0.2	..	..
10–24	95	0.3	151	0.4	+ 0.1	33.3
25–34	357	2.2	572	2.5	+ 0.3	13.6
35–44	1,039	8.5	1,593	8.9	+ 0.4	4.7
45–54	1,690	20.1	2,994	23.9	+ 3.8	18.9
55–64	2,115	39.6	3,736	48.5	+ 8.9	22.5
65–74	1,890	61.7	3,716	81.8	+20.1	32.6
75 and over	975	72.9	2,106	104.5	+31.6	43.3
All ages*	8,209	9.0	14,928	11.3	+ 2.3	25.6
45 and over	6,670	36.7	12,552	46.9	+10.2	27.8

*Including unknown ages.

APPENDIX F (PART I)

Table 69

Mortality from Cancer of the Female Generative Organs according to Age, United States Registration Area 1903-1907 Compared with 1908-1912

Ages at Death	1903-1907 Deaths from Cancer	1903-1907 Rate per 100,000 Population	1908-1912 Deaths from Cancer	1908-1912 Rate per 100,000 Population	Increase or Decrease Actual	Increase or Decrease Per Cent.
Under 10	8	0.0	23	0.1	+ 0.1	125.0
10–24	134	0.5	236	0.6	+ 0.1	20.0
25–34	1,158	7.3	1,831	8.2	+ 0.9	12.3
35–44	3,836	31.3	5,984	33.6	+ 2.3	7.3
45–54	5,810	69.0	9,090	72.6	+ 3.6	5.2
55–64	4,529	84.8	7,391	96.0	+11.2	13.2
65–74	2,440	79.7	4,463	98.3	+18.6	23.3
75 and over	886	66.3	1,870	92.8	+26.5	40.0
All ages*	18,840	20.6	30,907	23.4	+ 2.8	13.6
45 and over	13,665	75.3	22,814	85.2	+ 9.9	13.1

*Including unknown ages.

Table 70

Mortality from Cancer of the Female Breast, according to Age United States Registration Area 1903-1907 Compared with 1908-1912

Ages at Death	1903-1907 Deaths from Cancer	1903-1907 Rate per 100,000 Population	1908-1912 Deaths from Cancer	1908-1912 Rate per 100,000 Population	Increase or Decrease Actual	Increase or Decrease Per Cent.
Under 10	..	..	8	0.0	..	..
10–24	15	0.1	34	0.1	..	..
25–34	343	2.2	575	2.6	+ 0.4	18.2
35–44	1,683	13.7	2,900	16.3	+ 2.6	19.0
45–54	2,667	31.6	4,861	38.8	+ 7.2	22.8
55–64	2,684	50.3	4,362	56.6	+ 6.3	12.5
65–74	2,061	67.3	3,622	79.8	+12.5	18.6
75 and over	1,330	99.5	2,506	124.4	+24.9	25.0
All ages*	10,801	11.8	18,884	14.3	+ 2.5	21.2
45 and over	8,742	48.1	15,351	57.3	+ 9.2	19.1

*Including unknown ages.

APPENDIX F (PART I)

Table 71

Mortality from Cancer of the Skin, according to Age
United States Registration Area, 1903-1907 Compared with 1908-1912
Males

Ages at Death	1903-1907 Deaths from Cancer	1903-1907 Rate per 100,000 Population	1908-1912 Deaths from Cancer	1908-1912 Rate per 100,000 Population	Increase or Decrease Actual	Increase or Decrease Per Cent.
Under 10	8	0.0	34	0.1	+ 0.08	200.0
10–24	13	0.1	50	0.1	+ 0.08	160.0
25–34	33	0.2	55	0.2	+ 0.02	100.0
35–44	143	1.1	216	1.1	+ 0.03	2.8
45–54	353	3.9	560	4.0	+ 0.15	3.9
55–64	610	11.1	949	11.5	+ 0.38	3.4
65–74	795	27.0	1,343	29.8	+ 2.81	10.4
75 and over	903	77.4	1,641	91.3	+13.99	18.1
All ages*	2,865	3.0	4,857	3.5	+ 0.44	14.4
45 and over	2,661	14.2	4,493	15.7	+ 1.54	10.9

*Including unknown ages.

Table 72

Mortality from Cancer of the Skin, according to Age
United States Registration Area, 1903-1907 Compared with 1908-1912
Females

Ages at Death	1903-1907 Deaths from Cancer	1903-1907 Rate per 100,000 Population	1908-1912 Deaths from Cancer	1908-1912 Rate per 100,000 Population	Increase or Decrease Actual	Increase or Decrease Per Cent.
Under 10	9	0.0	30	0.1	+ 0.06	120.0
10–24	18	0.1	23	0.1	− 0.01	14.3
25–34	28	0.2	27	0.1	− 0.06	33.3
35–44	66	0.5	103	0.6	+ 0.04	7.4
45–54	158	1.9	233	1.9	− 0.02	1.1
55–64	272	5.1	385	5.0	− 0.09	1.8
65–74	387	12.7	677	14.9	+ 2.27	18.0
75 and over	626	46.8	1,254	62.3	+15.42	32.9
All ages*	1,568	1.7	2,738	2.1	+ 0.35	20.3
45 and over	1,443	8.0	2,549	9.5	+ 1.58	19.9

*Including unknown ages.

APPENDIX F (PART I)

Table 73

Mortality from Cancer of Other or Not Specified Organs and Parts* according to Age
United States Registration Area, 1903-1907 Compared with 1908-1912
Males

Ages at Death	1903-1907 Deaths from Cancer	1903-1907 Rate per 100,000 Population	1908-1912 Deaths from Cancer	1908-1912 Rate per 100,000 Population	Increase or Decrease Actual	Increase or Decrease Per Cent.
Under 10	317	1.7	463	1.7	..	..
10–24	533	2.0	705	1.8	−0.2	10.0
25–34	623	3.7	840	3.4	−0.3	8.1
35–44	1,293	9.6	1,598	8.1	−1.5	15.6
45–54	2,312	25.2	3,137	22.4	−2.8	11.1
55–64	3,232	59.0	4,351	52.8	−6.2	10.5
65–74	3,170	107.6	4,464	99.1	−8.5	7.9
75 and over	1,876	160.7	2,772	154.3	−6.4	4.0
All ages†	13,396	14.3	18,350	13.2	−1.1	7.7
45 and over	10,590	56.5	14,724	51.6	−4.9	8.7

*Including cancer of the male breast.
†Including unknown ages.

Table 74

Mortality from Cancer of Other or Not Specified Organs and Parts* according to Age
United States Registration Area, 1903-1907 Compared with 1908-1912
Females

Ages at Death	1903-1907 Deaths from Cancer	1903-1907 Rate per 100,000 Population	1908-1912 Deaths from Cancer	1908-1912 Rate per 100,000 Population	Increase or Decrease Actual	Increase or Decrease Per Cent.
Under 10	271	1.5	392	1.5	..	..
10–24	373	1.4	460	1.2	− 0.2	14.3
25–34	772	4.8	686	3.1	− 1.7	35.4
35–44	2,044	16.7	1,643	9.2	− 7.5	44.9
45–54	3,353	39.8	2,712	21.7	−18.1	45.5
55–64	3,674	68.8	2,973	38.6	−30.2	43.9
65–74	3,086	100.8	2,607	57.4	−43.4	43.1
75 and over	1,874	140.2	1,725	85.6	−54.6	38.9
All ages†	15,489	17.0	13,209	10.0	− 7.0	41.2
45 and over	11,987	66.0	10,017	37.4	−28.6	43.3

*Including cancer of the male breast.
†Including unknown ages.

APPENDIX F (PART II)

PART II

CANCER MORTALITY STATISTICS OF STATES AND CITIES OF THE UNITED STATES

Table	State	Period	Title	Page
1	Connecticut	1875-1913	Persons	455
2	Connecticut	1879-1913	Males	456
3	Connecticut	1879-1913	Females	457
4	Maine	1892-1913	Persons	458
5	Maine	1892-1913	Males	458
6	Maine	1892-1913	Females	459
7	Massachusetts	1856-1913	Persons	460
8	Massachusetts	1856-1913	Males	461
9	Massachusetts	1856-1913	Females	462
10	New Hampshire	1884-1913	Persons	463
11	New Hampshire	1887-1913	Males	463
12	New Hampshire	1887-1913	Females	464
13	New Jersey	1879-1913	Persons	465
14	New York	1885-1914	Persons	466
15	Rhode Island	1871-1913	Persons	467
16	Rhode Island	1871-1913	Males	468
17	Rhode Island	1871-1913	Females	469
18	Vermont	1871-1913	Persons	470
19	Vermont	1871-1896	Males	471
20	Vermont	1871-1896	Females	471
21	New England States, New York and New Jersey	1886-1913	Persons	472
	City			
22	Twenty Large American Cities	1881-1913	Persons	473
23	Southern Cities	1891-1914	White	474
24	Southern Cities	1891-1914	Colored	474
25	Augusta, Ga	1891-1913	Persons	475
26	Augusta, Ga	1891-1912	Males	475
27	Augusta, Ga	1891-1912	Females	476
28	Baltimore, Md	1871-1914	Persons	477
29	Baltimore, Md	1891-1914	White	478
30	Baltimore, Md	1891-1914	Colored	478
31	Baltimore, Md	1893-1902—1903-1912	By Organs and Parts	479
32	Boston, Mass	1881-1914	Persons	479
33	Boston, Mass	1881-1913	Males	480
34	Boston, Mass	1881-1913	Females	481
35	Boston, Mass	1903-1912	By Age and Sex	482
36	Boston, Mass	1903-1912	By Organs and Parts, according to Sex	482
37	Boston, Mass	1903-1912	By Organs and Parts, according to Age, Males	483

APPENDIX F (PART II)

City	Period	Title	Page
oston, Mass	1903-1912	By Organs and Parts, according to Age, Females	483
rooklyn, N. Y	1871-1913	Persons	484
rooklyn, N. Y	1872-1878—1903-1913	Males	485
rooklyn, N. Y	1872-1878—1903-1913	Females	485
uffalo, N. Y	1886-1913	Persons	486
uffalo, N. Y	1904-1905—1908-1913	By Sex	486
harleston, S. C	1881-1914	Persons	487
harleston, S. C	1881-1914	White	488
harleston, S. C	1881-1914	Colored	489
hicago, Ill	1871-1913	Persons	490
hicago, Ill	1895-1913	Males	491
hicago, Ill	1895-1913	Females	491
hicago, Ill	1903-1912	By Organs and Parts, according to Sex	492
incinnati, Ohio	1871-1913	Persons	492
incinnati, Ohio	1891-1913	Males	493
incinnati, Ohio	1891-1913	Females	493
leveland, Ohio	1884-1913	Persons	494
leveland, Ohio	1885-1913	Males	495
leveland, Ohio	1885-1913	Females	495
leveland, Ohio	1903-1912	By Organs and Parts, according to Sex	496
olumbus, Ohio	1900-1913	Persons	496
ayton, Ohio	1871-1913	Persons	497
ayton, Ohio	1876-1908	Males	498
ayton, Ohio	1876-1908	Females	499
enver, Colo	1892-1913	Persons	500
enver, Colo	1905-1913	By Sex	500
enver, Colo	1905-1912	By Organs and Parts, according to Sex	501
etroit, Mich	1883-1913	Persons	501
artford, Conn	1881-1913	Persons	502
artford, Conn	1886-1913	Males	503
artford, Conn	1886-1913	Females	503
oboken, N. J	1880-1913	Persons	504
oboken, N. J	1902-1913	By Sex	504
ndianapolis, Ind	1900-1913	Persons	505
ndianapolis, Ind	1906-1913	By Sex	505
ersey City, N. J	1879-1913	Persons	506
ersey City, N. J	1902-1913	By Sex	507
ansas City, Mo	1900-1913	Persons	507
os Angeles, Cal	1900-1913	Persons	508
ouisville, Ky	1890-1913	Persons	508
Memphis, Tenn	1891-1914	Persons	509
Memphis, Tenn	1891-1914	White	509
Memphis, Tenn	1891-1914	Colored	510
Milwaukee, Wis	1894-1913	Persons	510
Milwaukee, Wis	1898-1913	Males	511

APPENDIX F (PART II)

Table	City	Period	Title	Page
83	Milwaukee, Wis	1898-1913	Females	511
84	Minneapolis, Minn	1889-1913	Persons	512
85	Minneapolis, Minn	1908-1912	By Organs and Parts, according to Sex	512
86	Minneapolis, Minn	1908-1912	By Organs and Parts, according to Age	513
87	Nashville, Tenn	1879-1914	Persons	513
88	Nashville, Tenn	1885-1913	Males	514
89	Nashville, Tenn	1885-1913	Females	514
90	Nashville, Tenn	1885-1914	White	515
91	Nashville, Tenn	1885-1914	Colored	516
92	Nashville, Tenn	1903-1912	By Organs and Parts, according to Sex	516
93	Newark, N. J	1859-1913	Persons	517
94	Newark, N. J	1902-1913	By Sex	518
95	New Haven, Conn	1880-1913	Persons	518
96	New Haven, Conn	1880-1913	Males	519
97	New Haven, Conn	1880-1913	Females	520
98	New Orleans, La	1871-1914	Persons	521
99	New Orleans, La	1877-1914	White	522
100	New Orleans, La	1877-1914	Colored	523
101	New Orleans, La	1901-1913	By Sex	524
102	New Orleans, La	1904-1913	By Organs and Parts, according to Race	525
103	New Orleans, La	1904-1913	By Organs and Parts, according to Sex and Race	525
104	New Orleans, La., Charity Hospital	1908-1912	By Organs and Parts, White	526
105	New Orleans, La., Charity Hospital	1908-1912	By Organs and Parts, Colored	529
106	Greater New York, N. Y	1891-1914	Persons	532
107	Greater New York, N. Y	1891-1913	Males	532
108	Greater New York, N. Y	1891-1913	Females	533
109	Greater New York, N. Y	1893-1912	By Age	533
110	Greater New York, N. Y	1893-1912	By Age, Males	534
111	Greater New York, N. Y	1893-1912	By Age, Females	534
112	Greater New York, N. Y	1903-1912	Buccal Cavity, according to Sex	535
113	Greater New York, N. Y	1903-1912	Stomach and Liver, according to Sex	535
114	Greater New York, N. Y	1903-1912	Peritoneum, Intestines and Rectum, according to Sex	536
115	Greater New York, N. Y	1903-1912	Female Generative Organs	536
116	Greater New York, N. Y	1903-1912	Female Breast	536
117	Greater New York, N. Y	1903-1912	Skin, according to Sex	537
118	Greater New York, N. Y	1903-1912	Other or Not Specified Organs, according to Sex	537

APPENDIX F (PART II)

Table	City	Period	Title	Page
119	Greater New York, N. Y.	1903-1907—1908-1912	By Organs and Parts	538
120	Greater New York, N. Y.	1903-1907—1908-1912	By Organs and Parts, according to Sex	538
121	Greater New York, N. Y.	1903-1912	By Boroughs, according to Sex	539
122	Manhattan and Bronx, N. Y. C.	1871-1913	Persons	540
123	Manhattan and Bronx, N. Y. C.	1871-1913	Males	541
124	Manhattan and Bronx, N. Y. C.	1871-1913	Females	542
125	Omaha, Neb	1900-1913	Persons	542
126	Philadelphia, Pa	1861-1914	Persons	543
127	Philadelphia, Pa	1861-1914	Males	544
128	Philadelphia, Pa	1861-1914	Females	545
129	Philadelphia, Pa	1878-1903*	By Organs and Parts, according to Sex	546
130	Philadelphia, Pa	1891-1902—1903-1912	By Organs and Parts	546
131	Philadelphia, Pa	1881-1912	Buccal Cavity, according to Age	547
132	Philadelphia, Pa	1881-1912	Stomach and Liver, according to Age	547
133	Philadelphia, Pa	1881-1912	Peritoneum, Intestines and Rectum, according to Age	548
134	Philadelphia, Pa	1881-1912	Generative Organs, according to Age	548
135	Philadelphia, Pa	1881-1912	Breast, according to Age	549
136	Philadelphia, Pa	1881-1912	Skin, according to Age	549
137	Philadelphia, Pa	1881-1912	Other or Not Specified Organs, according to Age	550
138	Philadelphia, Pa	1881-1912	According to Age	550
139	Pittsburgh, Pa	1888-1913	Persons	551
140	Pittsburgh, Pa	1888-1899—1910-1913	Males	551
141	Pittsburgh, Pa	1888-1899—1910-1913	Females	552
142	Pittsburgh, Pa	1893-1902—1903-1912	According to Age	552
143	Pittsburgh, Pa	1888-1899	By Organs and Parts, according to Age	553
144	Pittsburgh, Pa	1888-1899	By Organs and Parts, according to Sex	553
145	Pittsburgh, Pa	1910-1913	By Organs and Parts, according to Sex	554
146	Pittsburgh, Pa	1888-1899—1910-1913	By Organs and Parts, according to Sex	554
147	Providence, R. I	1881-1914	Persons	555
148	Providence, R. I	1881-1914	Males	556
149	Providence, R. I	1881-1914	Females	557
150	Providence, R. I	1903-1912	By Organs and Parts, according to Sex	557
151	Richmond, Va	1879-1914	Persons	558
152	Richmond, Va	1882-1913	Males	559
153	Richmond, Va	1882-1913	Females	559
154	Richmond, Va	1879-1914	White	560

*Excluding 1897-1898.

APPENDIX F (PART II)

Table	City	Period	Title	Page
155	Richmond, Va	1879-1914	Colored	560
156	Richmond, Va	1903-1912	By Organs and Parts, according to Sex	561
157	Rochester, N. Y.	1891-1913	Persons	561
158	Rochester, N. Y.	1900-1913	By Sex	562
159	San Francisco, Cal	1884-1913	Persons	562
160	San Francisco, Cal	1884-1913	Males	563
161	San Francisco, Cal	1884-1913	Females	564
162	San Francisco, Cal	1906-1913	By Organs and Parts, according to Sex	564
163	San Francisco, Cal	1906-1911	By Age, according to Sex	565
164	Savannah, Ga	1881-1914	Persons	565
165	Savannah, Ga	1881-1914	White	566
166	Savannah, Ga	1881-1914	Colored	567
167	Seattle, Wash	1899-1914	Persons	567
168	Seattle, Wash	1901-1912	By Organs and Parts	568
169	Springfield, Mass	1890-1913	Persons	568
170	Springfield, Mass	1891-1913	Males	569
171	Springfield, Mass	1891-1913	Females	569
172	Springfield, Mass	1908-1912	By Organs and Parts, according to Sex	570
173	St. Louis, Mo	1881-1913	Persons	570
174	St. Louis, Mo	1887-1913	Males	571
175	St. Louis, Mo	1887-1913	Females	571
176	St. Paul, Minn	1885-1913	Persons	572
177	District of Columbia	1879-1914	Persons	573
178	District of Columbia	1879-1913	Males	574
179	District of Columbia	1879-1913	Females	575
180	District of Columbia	1882-1914	White	576
181	District of Columbia	1882-1914	Colored	577
182	District of Columbia	1901-1910	By Organs and Parts, according to Age, White Males	578
183	District of Columbia	1901-1910	By Organs and Parts, according to Age, White Females	579
184	District of Columbia	1901-1910	By Organs and Parts, according to Age, Colored Males	580
185	District of Columbia	1901-1910	By Organs and Parts, according to Age, Colored Females	581

APPENDIX F (PART II)

Table 1
Mortality from Cancer in the State of Connecticut
1875-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1875	580,075	204	35.2
1876	588,600	175	29.7
1877	597,125	219	36.7
1878	605,650	245	40.5
1879	614,175	209	34.0
1880	622,700	226	36.3
1876-1880	3,028,250	1,074	35.5
1881	635,055	269	42.4
1882	647,410	248	38.3
1883	659,766	305	46.2
1884	672,122	312	46.4
1885	684,478	288	42.1
1881-1885	3,298,831	1,422	43.1
1886	696,834	280	40.2
1887	709,190	316	44.6
1888	721,546	348	48.2
1889	733,902	324	44.1
1890	746,258	361	48.4
1886-1890	3,607,730	1,629	45.2
1891	762,474	417	54.7
1892	778,690	366	47.0
1893	794,906	405	50.9
1894	811,122	416	51.3
1895	827,338	471	56.9
1891-1895	3,974,530	2,075	52.2
1896	843,554	459	54.4
1897	859,770	514	59.8
1898	875,986	517	59.0
1899	892,203	569	63.8
1900	910,161	608	66.8
1896-1900	4,381,674	2,667	60.9
1901	931,055	635	68.2
1902	951,949	624	65.5
1903	972,844	721	74.1
1904	993,739	669	67.3
1905	1,014,634	747	73.6
1901-1905	4,864,221	3,396	69.8
1906	1,035,529	809	78.1
1907	1,056,424	809	76.6
1908	1,077,319	791	73.4
1909	1,098,214	876	79.8
1910	1,119,109	896	80.1
1906-1910	5,386,595	4,181	77.6
1911	1,140,003	890	78.1
1912	1,160,898	937	80.7
1913	1,181,793	1,000	84.6

Source: Bureau of Vital Statistics of the State of Connecticut, Annual Registration Reports.

APPENDIX F (PART II)

Table 2
Mortality from Cancer in the State of Connecticut, Males
1879-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1879	301,437	60	19.9
1880	305,808	68	22.2
1881	312,130	91	29.2
1882	318,461	66	20.7
1883	324,803	95	29.2
1884	331,155	101	30.5
1881-1884	1,286,549	353	27.4
1886	343,888	83	24.1
1887	350,269	108	30.8
1888	356,660	106	29.7
1889	363,061	112	30.8
1890	369,547	116	31.4
1886-1890	1,783,425	525	29.4
1891	377,882	142	37.6
1892	386,308	102	26.4
1893	394,750	131	33.2
1894	403,209	137	34.0
1895	411,683	134	32.5
1891-1895	1,973,832	646	32.7
1896	420,174	159	37.8
1897	428,681	172	40.1
1898	437,205	166	38.7
1899	445,745	169	37.9
1900	455,172	217	47.7
1896-1900	2,186,977	886	40.5
1901	466,086	243	52.1
1902	477,022	207	43.4
1903	487,979	226	46.3
1904	498,956	219	43.9
1905	509,955	270	52.9
1901-1905	2,439,998	1,165	47.7

Year	Population	Deaths from Cancer	Rate 100,0 Popula
1906	521,078	314	6[illegible]
1907	532,226	299	5[illegible]
1908	543,400	292	5[illegible]
1909	554,598	316	5[illegible]
1910	565,822	328	5[illegible]
1906-1910	2,717,124	1,549	5[illegible]
1911	577,070	294	5[illegible]
1912	588,343	357	6[illegible]
1913	599,639	377	6[illegible]

Source: Bureau of Vital Statistics the State of Connecticut, Annual Regis tion Reports.

Table 3
Mortality from Cancer in the State of Connecticut, Females
1879-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
	312,738	149	47.6
	316,892	158	49.9
	322,925	178	55.1
	328,949	182	55.3
	334,963	210	62.7
	340,967	211	61.9
14	1,327,804	781	58.8
	352,946	197	55.8
	358,921	208	58.0
	364,886	242	66.3
	370,841	212	57.2
	376,711	245	65.0
00	1,824,305	1,104	60.5
	384,592	275	71.5
	392,382	264	67.3
	400,156	274	68.5
	407,913	279	68.4
	415,655	337	81.1
5	2,000,698	1,429	71.4
	423,380	300	70.9
	431,089	342	79.3
	438,781	348	79.3
	446,458	400	89.6
	454,989	391	85.9
0	2,194,697	1,781	81.2
	464,969	392	84.3
	474,927	417	87.8
	484,865	495	102.1
	494,783	450	90.9
	504,679	477	94.5
5	2,424,223	2,231	92.0
1906	514,451	495	96.2
1907	524,198	510	97.3
1908	533,919	499	93.5
1909	543,616	560	103.0
1910	553,287	568	102.7
1906-1910	2,669,471	2,632	98.6
1911	562,933	596	105.9
1912	572,555	580	101.3
1913	582,154	623	107.0

Source: Bureau of Vital Statistics of the State of Connecticut, Annual Registration Reports.

APPENDIX F (PART II)

Table 4
Mortality from Cancer in the State of Maine
1892-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1892	667,762	404	60.5
1893	671,100	433	64.5
1894	674,438	474	70.3
1895	677,776	480	70.8
1892-1895	2,691,076	1,791	66.6
1896	681,114	518	76.1
1897	684,452	463	67.6
1898	687,790	531	77.2
1899	691,128	541	78.3
1900	694,870	526	75.7
1896-1900	3,439,354	2,579	75.0
1901	699,721	570	81.5
1902	704,572	615	87.3
1903	709,423	598	84.3
1904	714,274	611	85.5
1905	719,125	662	92.1
1901-1905	3,547,115	3,056	86.2
1906	723,976	617	85.2
1907	728,827	737	101.1
1908	733,678	710	96.8
1909	738,530	727	98.4
1910	743,382	762	102.5
1906-1910	3,668,393	3,553	96.9
1911	748,233	738	98.6
1912	753,085	828	109.9
1913	757,936	838	110.6

Source: Annual Reports upon the Births, Marriages, Divorces and Deaths in the State of Maine.

Table 5
Mortality from Cancer in the State of Maine, Males
1892-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1892	336,085	150	44.6
1893	337,899	170	50.3
1894	339,714	177	52.1
1895	341,531	173	50.7
1892-1895	1,355,229	670	49.4
1896	343,350	185	53.9
1897	345,169	188	54.5
1898	347,059	197	56.8
1899	348,951	179	51.3
1900	351,187	188	53.5
1896-1900	1,735,716	937	54.0
1901	353,779	199	56.2
1902	356,373	224	62.9
1903	358,968	210	58.5
1904	361,565	245	67.8
1905	364,237	238	65.3
1901-1905	1.794,922	1,116	62.2
1906	366,911	238	64.9
1907	369,588	266	72.0
1908	372,268	243	65.3
1909	374,952	271	72.3
1910	377,564	260	68.9
1906-1910	1,861,283	1,278	68.7
1911	380,177	254	66.8
1912	382,868	261	68.2
1913	385,637	290	75.2

Source: Annual Reports upon the Births, Marriages, Divorces and Deaths in the State of Maine.

APPENDIX F (PART II)

Table 6
Mortality from Cancer in the State of Maine, Females
1892-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1892	331,677	254	76.6
1893	333,201	263	78.9
1894	334,724	297	88.7
1895	336,245	307	91.3
1892-1895	1,335,847	1,121	83.9
1896	337,764	333	98.6
1897	339,283	275	81.1
1898	340,731	334	98.0
1899	342,177	362	105.8
1900	343,683	338	98.3
1896-1900	1,703,638	1,642	96.4
1901	345,942	371	107.2
1902	348,199	391	112.3
1903	350,455	388	110.7
1904	352,709	366	103.8
1905	354,888	424	119.5
1901-1905	1,752,193	1,940	110.7
1906	357,065	379	106.1
1907	359,239	471	131.1
1908	361,410	467	129.2
1909	363,578	456	125.4
1910	365,818	502	137.2
1906-1910	1,807,110	2,275	125.9
1911	368,056	484	131.5
1912	370,217	567	153.2
1913	372,299	548	147.2

Source: Annual Reports upon the Births, Marriages, Divorces and Deaths in the State of Maine.

APPENDIX F (PART II)

Table 7
Mortality from Cancer in the State of Massachusetts
1856-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1856	1,151,461	217	18.8
1857	1,170,864	242	20.7
1858	1,190,584	289	24.3
1859	1,210,657	306	25.3
1860	1,231,066	335*	27.2
1856-1860	5,954,632	1,389	23.3
1861	1,238,177	336	27.1
1862	1,245,328	319	25.6
1863	1,252,521	324	25.9
1864	1,259,756	330	26.2
1865	1,267,031	375	29.6
1861-1865	6,262,813	1,684	26.9
1866	1,302,992	416	31.9
1867	1,339,976	395	29.5
1868	1,378,010	445	32.3
1869	1,417,125	492	34.7
1870	1,457,351	516	35.4
1866-1870	6,895,454	2,264	32.8
1871	1,494,337	551	36.9
1872	1,532,260	542	35.4
1873	1,571,142	611	38.9
1874	1,611,016	585	36.3
1875	1,651,912	593	35.9
1871-1875	7,860,667	2,882	36.7
1876	1,677,351	657	39.2
1877	1,703,182	646	37.9
1878	1,729,412	807	46.7
1879	1,756,043	862	49.1
1880	1,783,085	928	52.0
1876-1880	8,649,073	3,900	45.1
1881	1,813,818	949	52.3
1882	1,845,086	987	53.5
1883	1,876,895	1,026	54.7
1884	1,909,810	1,060	55.5
1885	1,942,141	1,087	56.0
1881-1885	9,387,750	5,109	54.4
1886	1,998,174	1,104	55.3
1887	2,055,821	1,174	57.1
1888	2,115,131	1,275	60.3
1889	2,176,153	1,325	60.9
1890	2,238,943	1,387	61.9
1886-1890	10,584,222	6,265	59.2
1891	2,288,911	1,395	60.9
1892	2,339,994	1,402	59.9
1893	2,392,217	1,533	64.1
1894	2,445,605	1,568	64.1
1895	2,500,183	1,749	70.0
1891-1895	11,966,910	7,647	63.9
1896	2,558,437	1,798	70.3
1897	2,618,048	1,739	66.4
1898	2,679,048	1,907	71.2
1899	2,741,470	1,838	67.0
1900	2,805,346	1,998	71.2
1896-1900	13,402,349	9,280	69.2
1901	2,845,012	2,080	73.1
1902	2,884,679	2,141	74.2
1903	2,924,346	2,243	76.7
1904	2,964,013	2,351	79.3
1905	3,015,873	2,501	82.9
1901-1905	14,633,923	11,316	77.3
1906	3,089,029	2,603	84.3
1907	3,162,186	2,744	86.8
1908	3,235,343	2,814	87.0
1909	3,308,500	2,871	86.8
1910	3,381,657	3,028	89.5
1906-1910	16,176,715	14,060	86.9
1911	3,454,813	3,199	92.6
1912	3,491,888	3,282	94.0
1913	3,548,705	3,526	99.4

Source: Annual Reports of Births, Marriages and Deaths in Massachusetts.

*Vital Statistics of Massachusetts, 1856-1895.

APPENDIX F (PART II)

Table 8

Mortality from Cancer in the State of Massachusetts, Males 1856-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1856	559,034	72	12.9
1857	568,220	78	13.7
1858	577,552	98	17.0
1859	587,048	99	16.9
1856-1859	2,291,854	347	15.1
1861	597,792	100	16.7
1862	598,878	103	17.2
1863	599,958	107	17.8
1864	601,030	112	18.6
1865	602,010	124	20.6
1861-1865	2,999,668	546	18.2
1866	621,006	109	17.6
1867	640,643	136	21.2
1868	661,031	146	22.1
1869	682,062	146	21.4
1870	703,779	184	26.1
1866-1870	3,308,521	721	21.8
1871	721,615	166	23.0
1872	739,162	182	24.6
1873	757,133	198	26.2
1874	775,643	190	24.5
1875	794,404	173	21.8
1871-1875	3,787,857	909	24.0
1876	806,974	202	25.0
1877	819,571	176	21.5
1878	832,366	260	31.2
1879	..	..	..
1880	858,555	306	35.6
1876-1880	3,317,466	944	28.5
1881	872,991	338	38.7
1882	887,671	303	34.1
1883	902,599	325	36.0
1884	917,855	351	38.2
1885	932,810	332	35.6
1881-1885	4,513,926	1,649	36.5
1886	961,921	334	34.7
1887	991,934	358	36.1
1888	1,022,877	411	40.2
1889	1,054,781	413	39.2
1890	1,087,679	414	38.1
1886-1890	5,119,192	1,930	37.7
1891	1,111,953	436	39.2
1892	1,136,769	466	41.0
1893	1,162,139	502	43.2
1894	1,188,075	519	43.7
1895	1,214,589	535	44.0
1891-1895	5,813,525	2,458	42.3
1896	1,243,656	594	47.8
1897	1,273,419	565	44.4
1898	1,303,893	598	45.9
1899	1,335,370	598	44.8
1900	1,367,606	684	50.0
1896-1900	6,523,944	3,039	46.6
1901	1,386,659	704	50.8
1902	1,405,416	686	48.8
1903	1,424,157	741	52.0
1904	1,442,882	808	56.0
1905	1,467,524	843	57.4
1901-1905	7,126,638	3,782	53.1
1906	1,506,519	977	64.9
1907	1,545,360	932	60.3
1908	1,584,347	966	61.0
1909	1,623,481	991	61.0
1910	1,662,761	1,065	64.1
1906-1910	7,922,468	4,931	62.2
1911	1,702,186	1,177	69.1
1912	1,723,946	1,115	64.7
1913	1,755,544	1,282	73.0

Source: Annual Reports of Births, Marriages and Deaths in Massachusetts.

APPENDIX F (PART II)

Table 9
Mortality from Cancer in the State of Massachusetts, Females
1856-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1856	592,427	145	24.5
1857	602,644	164	27.2
1858	613,032	191	31.2
1859	623,609	207	33.2
1856-1859	2,431,712	707	29.1
1861	640,385	236	36.9
1862	646,450	216	33.4
1863	652,563	217	33.3
1864	658,726	218	33.1
1865	665,021	251	37.7
1861-1865	3,263,145	1,138	34.9
1866	681,986	307	45.0
1867	699,333	259	37.0
1868	716,979	299	41.7
1869	735,063	346	47.1
1870	753,572	332	44.1
1866-1870	3,586,933	1,543	43.0
1871	772,722	385	49.8
1872	793,098	360	45.4
1873	814,009	413	50.7
1874	835,473	395	47.3
1875	857,508	420	49.0
1871-1875	4,072,810	1,973	48.4
1876	870,377	455	52.3
1877	883,611	470	53.2
1878	897,046	547	61.0
1879	..	..	..
1880	924,530	622	67.3
1876-1880	3,575,564	2,094	58.6
1881	940,827	611	64.9
1882	957,415	684	71.4
1883	974,296	701	71.9
1884	991,955	709	71.5
1885	1,009,331	755	74.8
1881-1885	4,873,824	3,460	71.0

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1886	1,036,253	770	74.3
1887	1,063,887	816	76.7
1888	1,092,254	864	79.1
1889	1,121,372	912	81.3
1890	1,151,264	973	84.5
1886-1890	5,465,030	4,335	79.3
1891	1,176,958	959	81.5
1892	1,203,225	936	77.8
1893	1,230,078	1,031	83.8
1894	1,257,530	1,049	83.4
1895	1,285,594	1,214	94.4
1891-1895	6,153,385	5,189	84.3
1896	1,314,781	1,204	91.6
1897	1,344,629	1,174	87.3
1898	1,375,155	1,309	95.2
1899	1,406,100	1,240	88.2
1900	1,437,740	1,314	91.4
1896-1900	6,878,405	6,241	90.7
1901	1,458,353	1,376	94.4
1902	1,479,263	1,455	98.4
1903	1,500,189	1,502	100.1
1904	1,521,131	1,543	101.4
1905	1,548,349	1,658	107.1
1901-1905	7,507,285	7,534	100.4
1906	1,582,510	1,626	102.7
1907	1,616,826	1,812	112.1
1908	1,650,996	1,848	111.9
1909	1,685,019	1,880	111.6
1910	1,718,896	1,963	114.2
1906-1910	8,254,247	9,129	110.6
1911	1,752,627	2,022	115.4
1912	1,767,942	2,167	122.6
1913	1,793,161	2,244	125.1

Source: Annual Reports of Births, Marriages and Deaths in Massachusetts.

Table 10
ality from Cancer in the State of New Hampshire
1884-1913

	Population	Deaths from Cancer	Rate per 100,000 Population
	358,806	213	59.4
	361,760	213	58.9
	364,714	206	56.5
	367,668	218	59.3
	370,622	203	54.8
	373,576	213	57.0
	376,530	276	73.3
390	1,853,110	1,116	60.2
	380,035	222	58.4
	383,540	235	61.3
	387,046	283	73.1
	390,552	230	58.9
	394,058	266	67.5
395	1,935,231	1,236	63.9
	397,564	275	69.2
	401,070	265	66.1
	404,576	305	75.4
	408,082	279	68.4
	411,588	292	70.9
)00	2,022,880	1,416	70.0
	413,670	364	88.0
	415,592	341	82.1
	417,514	314	75.2
	419,436	326	77.7
	421,358	344	81.6
)05	2,087,570	1,689	80.9
	423,280	354	83.6
	425,203	386	90.8
	427,126	373	87.3
	429,049	383	89.3
	430,972	406	94.2
)10	2,135,630	1,902	89.1
	432,894	408	94.2
	434,818	453	104.2
	436,742	453	103.7

ce: Reports relating to the Regis- and Return of Births, Marriages, s and Deaths in New Hampshire.

Table 11
Mortality from Cancer in the State of New Hampshire, Males
1887-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1887	181,738	70	38.5
1888	183,347	66	36.0
1889	184,957	70	37.8
1890	186,571	86	46.1
1887-1890	736,613	292	39.6
1891	188,459	74	39.3
1892	190,351	69	36.2
1893	192,246	106	55.1
1894	194,143	80	41.2
1895	196,044	100	51.0
1891-1895	961,243	429	44.6
1896	197,907	84	42.4
1897	199,773	87	43.5
1898	201,641	102	50.6
1899	203,510	89	43.7
1900	205,382	88	42.8
1896-1900	1,008,213	450	44.6
1901	206,587	114	55.2
1902	207,713	120	57.8
1903	208,841	110	52.7
1904	209,928	111	52.9
1905	211,016	126	59.7
1901-1905	1,044,085	581	55.6
1906	212,106	109	51.4
1907	213,197	123	57.7
1908	214,289	126	58.8
1909	215,383	131	60.8
1910	216,477	155	71.6
1906-1910	1,071,452	644	60.1
1911	217,573	138	63.4
1912	218,670	176	80.5
1913	219,767	164	74.6

Source: Reports relating to the Registration and Return of Births, Marriages, Divorces and Deaths in New Hampshire.

APPENDIX F (PART II)

Table 12
Mortality from Cancer in the State of New Hampshire, Females
1887-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1887	185,930	148	79.6
1888	187,275	137	73.2
1889	188,619	143	75.8
1890	189,959	190	100.0
1887-1890	751,783	618	82.2
1891	191,576	148	77.3
1892	193,189	166	85.9
1893	194,800	177	90.9
1894	196,409	150	76.4
1895	198,014	166	83.8
1891-1895	973,988	807	82.9
1896	199,657	191	95.7
1897	201,297	178	88.4
1898	202,935	203	100.0
1899	204,572	190	92.9
1900	206,206	204	98.9
1896-1900	1,014,667	966	95.2
1901	207,083	250	120.7
1902	207,879	221	106.3
1903	208,673	204	97.8
1904	209,508	215	102.6
1905	210,342	218	103.6
1901-1905	1,043,485	1,108	106.2
1906	211,174	245	116.0
1907	212,006	263	124.1
1908	212,837	247	116.1
1909	213,666	252	117.9
1910	214,495	251	117.0
1906-1910	1,064,178	1,258	118.2
1911	215,321	270	125.4
1912	216,148	277	128.2
1913	216,975	289	133.2

Source: Reports relating to the Registration and Return of Births, Marriages, Divorces and Deaths in New Hampshire.

APPENDIX F (PART II)

Table 13

Mortality from Cancer in the State of New Jersey

1879-1913

r	Population	Deaths from Cancer	Rate per 100,000 Population
9	1,109,009	378	34.1
0	1,131,116	425	37.6
1	1,160,499	451	38.9
2	1,189,882	402	33.8
3	1,219,265	461	37.8
4	1,248,649	484	38.8
5	1,278,033	498	39.0
1885	6,096,328	2,296	37.7
6	1,311,413	546	41.6
7	1,344,793	574	42.7
8	1,378,173	612	44.4
9	1,411,553	579	41.0
0	1,444,933	640	44.3
1890	6,890,865	2,951	42.8
1	1,490,567	642	43.1
2	1,536,201	688	44.8
3	1,581,836	723	45.7
4	1,627,471	731	44.9
5	1,673,106	770	46.0
1895	7,909,181	3,554	44.9
6	1,715,218	811	47.3
7	1,757,330	857	48.8
8	1,799,443	852	47.3
9	1,841,556	946	51.4
0	1,883,669	921	48.9
900	8,997,216	4,387	48.8

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	1,935,763	1,042	53.8
1902	1,987,858	1,031	51.9
1903	2,039,953	1,132	55.5
1904	2,092,048	1,125	53.8
1905	2,150,861	1,282	59.6
1901-1905	10,206,483	5,612	55.0
1906	2,231,481	1,389	62.2
1907	2,312,101	1,466	63.4
1908	2,392,721	1,535	64.2
1909	2,473,342	1,663	67.2
1910	2,553,963	1,838	72.0
1906-1910	11,963,608	7,891	66.0
1911	2,634,583	1,942	73.7
1912	2,683,309	1,984	73.9
1913	2,749,486	2,120	77.1

Source: Annual Reports of the Board of Health of the State of New Jersey.

APPENDIX F (PART II)

Table 14
Mortality from Cancer in the State of New York
1885-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1885	5,543,021	1,887	34.0
1886	5,635,051	2,050	36.4
1887	5,723,356	2,363	41.3
1888	5,814,855	2,497	42.9
1889	5,906,354	2,638	44.7
1890	5,997,853	2,868	47.8
1886-1890	29,077,469	12,416	42.7
1891	6,258,259	3,028	48.4
1892	6,513,343	3,152	48.4
1893	6,607,787	3,232	48.9
1894	6,702,230	3,305	49.3
1895	6,796,674	3,554	52.3
1891-1895	32,878,293	16,271	49.5
1896	6,891,118	3,789	55.0
1897	6,985,562	4,131	59.1
1898	7,080,006	4,375	61.8
1899	7,174,450	4,535	63.2
1900	7,268,894	4,871	67.0
1896-1900	35,400,030	21,701	61.3
1901	7,428,576	5,033	67.8
1902	7,588,259	4,989	65.7
1903	7,747,942	5,456	70.4
1904	7,907,625	5,697	72.0
1905	8,085,194	6,055	74.9
1901-1905	38,757,596	27,230	70.3
1906	8,299,820	6,169	74.3
1907	8,514,447	6,420	75.4
1908	8,729,074	6,554	75.1
1909	8,943,701	7,060	78.9
1910	9,158,328	7,522	82.1
1906-1910	43,645,370	33,725	77.3
1911	9,372,954	7,970	85.0
1912	9,526,146	8,250	86.6
1913	9,712,954	8,536	87.9
1914	9,838,328	8,830	89.8

Source: Annual Reports of the State Department of Health of New York.

APPENDIX F (PART II)

Table 15

Mortality from Cancer in the State of Rhode Island 1871-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1871	225,530	66	29.3
1872	233,707	95	40.6
1873	241,884	106	43.8
1874	250,061	87	34.8
1875	258,239	95	36.8
1871-1875	1,209,421	449	37.1
1876	261,897	106	40.5
1877	265,555	135	50.8
1878	269,213	119	44.2
1879	272,872	125	45.8
1880	276,531	125	45.2
1876-1880	1,346,068	610	45.3
1881	282,081	145	51.4
1882	287,631	132	45.9
1883	293,182	169	57.6
1884	298,733	156	52.2
1885	304,284	193	63.4
1881-1885	1,465,911	795	54.2
1886	312,528	162	51.8
1887	320,772	159	49.6
1888	329,016	193	58.7
1889	337,261	189	56.0
1890	345,506	165	47.8
1886-1890	1,645,083	868	52.8
1891	353,356	177	50.1
1892	361,206	181	50.1
1893	369,056	205	55.5
1894	376,907	216	57.3
1895	384,758	240	62.4
1891-1895	1,845,283	1,019	55.2
1896	393,517	238	60.5
1897	402,276	271	67.4
1898	411,036	293	71.3
1899	419,796	300	71.5
1900	428,556	303	70.7
1896-1900	2,055,181	1,405	68.4
1901	438,861	319	72.7
1902	449,166	359	79.9
1903	459,471	350	76.2
1904	469,776	401	85.4
1905	481,150	383	79.6
1901-1905	2,298,424	1,812	78.8
1906	493,976	377	76.3
1907	506,802	451	89.0
1908	519,628	418	80.4
1909	532,455	461	86.6
1910	545,282	474	86.9
1906-1910	2,598,143	2,181	83.9
1911	558,108	486	87.1
1912	568,114	506	89.1
1913	579,665	534	92.1

Source: Annual Reports relating to Registry and Return of Births, Marriages, and Deaths, and of Divorce, in the State of Rhode Island. 1912-1913, United States Mortality Statistics.

APPENDIX F (PART II)

Table 16
Mortality from Cancer in the State of Rhode Island, Males
1871-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1871	108,705	25	23.0
1872	112,623	26	23.1
1873	116,540	45	38.6
1874	120,454	23	19.1
1875	124,368	24	19.3
1871-1875	582,690	143	24.5
1876	126,103	27	21.4
1877	127,838	29	22.7
1878	129,572	38	29.3
1879	131,306	39	29.7
1880	133,039	45	33.8
1876-1880	647,858	178	27.5
1881	135,850	40	29.4
1882	138,667	40	28.8
1883	141,490	51	36.0
1884	144,169	39	27.1
1885	147,152	52	35.3
1881-1885	707,328	222	31.4
1886	151,295	42	27.8
1887	155,446	49	31.5
1888	159,639	67	42.0
1889	163,841	65	39.7
1890	168,020	56	33.3
1886-1890	798,241	279	35.0
1891	171,978	48	27.9
1892	175,980	53	30.1
1893	179,989	54	30.0
1894	184,006	68	37.0
1895	188,031	77	41.0
1891-1895	899,984	300	33.3
1896	192,509	69	35.8
1897	196,995	86	43.7
1898	201,490	88	43.7
1899	205,994	98	47.6
1900	210,507	102	48.5
1896-1900	1,007,495	443	44.0

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	215,876	101	46.8
1902	221,259	129	58.3
1903	226,657	121	53.4
1904	232,069	130	56.0
1905	238,025	128	53.8
1901-1905	1,133,886	609	53.7
1906	244,716	126	51.5
1907	251,424	143	56.9
1908	258,151	144	55.8
1909	264,896	158	59.6
1910	271,659	163	60.0
1906-1910	1,290,846	734	56.9
1911	278,440	173	62.1
1912	283,830	173	61.0
1913	289,671	185	63.9

Source: Annual Reports relating to Registry and Return of Births, Marriages, and Deaths, and of Divorce, in the State of Rhode Island. 1912-1913, United States Mortality Statistics.

APPENDIX F (PART II)

Table 17

Mortality from Cancer in the State of Rhode Island, Females 1871-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
	116,825	41	35.1
	121,084	69	57.0
	125,344	61	48.7
	129,607	64	49.4
	133,871	71	53.0
75	626,731	306	48.8
	135,794	79	58.2
	137,717	106	77.0
	139,641	81	58.0
	141,566	86	60.7
	143,492	80	55.8
80	698,210	432	61.9
	146,231	105	71.8
	148,964	92	61.8
	151,692	118	77.8
	154,564	117	75.7
	157,132	141	89.7
85	758,583	573	75.5
	161,233	120	74.4
	165,326	110	66.5
	169,377	126	74.4
	173,420	124	71.5
	177,486	109	61.4
90	846,842	589	69.6
	181,378	129	71.1
	185,226	128	69.1
	189,067	151	79.9
	192,901	148	76.7
	196,727	163	82.9
95	945,299	719	76.1
	201,008	169	84.1
	205,281	185	90.1
	209,546	205	97.8
	213,802	202	94.5
	218,049	201	92.2
00	1,047,686	962	91.8

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	222,985	218	97.8
1902	227,907	230	100.9
1903	232,814	229	98.4
1904	237,707	271	114.0
1905	243,125	255	104.9
1901-1905	1,164,538	1,203	103.3
1906	249,260	251	100.7
1907	255,378	308	120.6
1908	261,477	274	104.8
1909	267,559	303	113.2
1910	273,623	311	113.7
1906-1910	1,307,297	1,447	110.7
1911	279,668	313	111.9
1912	284,284	333	117.1
1913	289,994	349	120.3

Source: Annual Reports relating to Registry and Return of Births, Marriages, and Deaths, and of Divorce, in the State of Rhode Island. 1912-1913, United States Mortality Statistics.

APPENDIX F (PART II)

Table 18
Mortality from Cancer in the State of Vermont
1871-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1871	330,724	149	45.1
1872	330,897	108	32.6
1873	331,070	117	35.3
1874	331,243	117	35.3
1875	331,416	125	37.7
1871-1875	1,655,350	616	37.2
1876	331,590	174	52.5
1877	331,764	158	47.6
1878	331,938	177	53.3
1879	332,112	155	46.7
1880	332,286	177	53.3
1876-1880	1,659,690	841	50.7
1881	332,299	147	44.2
1882	332,312	175	52.7
1883	332,325	187	56.3
1884	332,338	174	52.4
1885	332,352	192	57.8
1881-1885	1,661,626	875	52.7
1886	332,366	188	56.6
1887	332,380	205	61.7
1888	332,394	188	56.6
1889	332,408	198	59.6
1890	332,422	191	57.5
1886-1890	1,661,970	970	58.4
1891	333,543	181	54.3
1892	334,665	178	53.2
1893	335,787	193	57.5
1894	336,909	192	57.0
1895	338,031	199	58.9
1891-1895	1,678,935	943	56.2
1896	339,153	200	59.0
1897	340,275	207	60.8
1898	341,397	242	70.9
1899	342,519	270	78.8
1900	343,641	291	84.7
1896-1900	1,706,985	1,210	70.9
1901	344,992	242	70.1
1902	346,239	245	70.8
1903	347,486	313	90.1
1904	348,733	299	85.7
1905	349,980	291	83.1
1901-1905	1,737,430	1,390	80.0
1906	351,227	287	81.7
1907	352,474	337	95.6
1908	353,721	319	90.2
1909	354,968	335	94.4
1910	356,216	369	103.6
1906-1910	1,768,606	1,647	93.1
1911	357,463	347	97.1
1912	358,710	396	110.4
1913	359,957	378	105.0

Source: Report to the Legislature of Vermont relating to the Registry and Returns of Births, Marriages, Deaths and Divorces in the State.

APPENDIX F (PART II)

Table 19
Mortality from Cancer in the State of Vermont, Males
1871-1896

Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
	165,792	45	27.1	1886	168,377	80	47.5
	165,912	32	19.3	1887	168,616	67	39.7
	166,032	48	28.9	1888	168,856	78	46.2
	166,151	47	28.3	1889	169,096	68	40.2
	166,271	36	21.7	1890	169,336	77	45.5
75	830,158	208	25.1	1886-1890	844,281	370	43.8
	166,392	65	39.1	1891	169,940	60	35.3
	166,512	62	37.2	1892	170,545	52	30.5
	166,333	65	39.0	1893	171,151	62	36.2
	166,753	66	39.6	1894	171,723	64	37.3
	166,874	68	40.7	1895	172,294	69	40.0
80	833,164	326	39.1	1891-1895	855,653	307	35.9
	167,113	50	29.9	1896	172,866	74	42.8
	167,352	58	34.7				
	167,591	62	37.0				
	167,831	61	36.3				
	168,104	88	52.3				
85	837,991	319	38.1				

Source: Report to the Legislature of Vermont relating to the Registry and Returns of Births, Marriages, Deaths and Divorces in the State.

Table 20
Mortality from Cancer in the State of Vermont, Females
1871-1896

Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
	164,932	104	63.1	1886	163,989	108	65.9
	164,985	76	46.1	1887	163,764	138	84.3
	165,038	69	41.8	1888	163,538	110	67.3
	165,092	70	42.4	1889	163,312	130	79.6
	165,145	89	53.9	1890	163,086	114	69.9
75	825,192	408	49.4	1886-1890	817,689	600	73.4
	165,198	109	66.0	1891	163,603	121	74.0
	165,252	96	58.1	1892	164,120	126	76.8
	165,305	112	67.8	1893	164,636	131	79.6
	165,359	89	53.8	1894	165,186	128	77.5
	165,412	109	65.9	1895	165,737	130	78.4
80	826,526	515	62.3	1891-1895	823,282	636	77.3
	165,186	97	58.7	1896	166,287	126	75.8
	164,960	117	70.9				
	164,734	125	75.9				
	164,507	113	68.7				
	164,248	104	63.3				
85	823,635	556	67.5				

Source: Report to the Legislature of Vermont relating to the Registry and Returns of Births, Marriages, Deaths and Divorces in the State.

APPENDIX F (PART II)

Table 21

Mortality from Cancer in the New England States New York and New Jersey 1886-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1886	10,651,080	4,536	42.6
1887	10,853,980	5,009	46.1
1888	11,061,737	5,316	48.1
1889	11,271,207	5,466	48.5
1890	11,482,445	5,888	51.3
1886-1890	55,320,449	26,215	47.4
1891	11,867,145	6,062	51.1
1892	12,915,401	6,606	51.1
1893	13,139,735	7,007	53.3
1894	13,365,234	7,132	53.4
1895	13,591,924	7,729	56.9
1891-1895	64,879,439	34,536	53.2
1896	13,819,675	8,088	58.5
1897	14,048,783	8,447	60.1
1898	14,279,282	9,022	63.2
1899	14,511,204	9,278	63.9
1900	14,746,725	9,810	66.5
1896-1900	71,405,669	44,645	62.5
1901	15,037,650	10,285	68.4
1902	15,328,314	10,345	67.5
1903	15,618,979	11,127	71.2
1904	15,909,644	11,479	72.2
1905	16,238,175	12,265	75.5
1901-1905	78,132,762	55,501	71.0
1906	16,648,318	12,605	75.7
1907	17,058,464	13,350	78.3
1908	17,468,610	13,514	77.4
1909	17,878,759	14,376	80.4
1910	18,288,909	15,295	83.6
1906-1910	87,343,060	69,140	79.2
1911	18,699,051	15,980	85.5
1912	18,976,968	16,640	87.7
1913	19,327,238	17,385	90.0

Note: Maine not included 1886-1891.

APPENDIX F (PART II)

Table 22

Mortality from Cancer in Twenty Large American Cities 1881-1913

	Population	Deaths from Cancer	Rate per 100,000 Population
	5,673,905	2,812	49.6
	5,869,498	2,820	48.0
	6,065,384	2,847	46.9
	6,261,552	3,137	50.1
	6,458,008	3,119	48.3
5	30,328,347	14,735	48.6
	6,658,686	3,209	48.2
	6,859,665	3,495	51.0
	7,059,924	3,512	49.7
	7,261,499	3,567	49.1
	7,463,170	4,101	54.9
0	35,302,944	17,884	50.7
	7,702,582	4,213	54.7
	7,942,266	4,371	55.0
	8,182,229	4,431	54.2
	8,422,476	4,547	54.0
	8,662,957	4,951	57.2
5	40,912,510	22,513	55.0
	8,909,328	5,178	58.1
	9,155,967	5,325	58.2
	9,402,921	5,649	60.1
	9,650,196	6,047	62.7
	9,897,855	6,334	64.0
0	47,016,267	28,533	60.7
	10,157,693	6,771	66.7
	10,417,536	6,964	66.8
	10,677,385	7,399	69.3
	10,937,234	7,778	71.1
	11,197,087	8,215	73.4
5	53,386,935	37,127	69.5

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	11,472,516	8,713	75.9
1907	11,747,948	9,274	78.9
1908	12,023,381	9,355	77.8
1909	12,298,814	9,934	80.8
1910	12,574,254	10,425	82.9
1906-1910	60,116,913	47,701	79.3
1911	12,849,687	10,713	83.4
1912	13,125,121	11,203	85.4
1913	13,400,553	11,971	89.3

Note: Includes Baltimore, Md., Boston, Mass., Brooklyn, N. Y., Charleston, S. C., Chicago, Ill., Cincinnati, Ohio, Dayton, Ohio, Hartford, Conn., Hoboken, N. J., Jersey City, N. J., Nashville, Tenn., Newark, N. J., New Haven, Conn., New Orleans, La., New York, N. Y., Philadelphia, Pa., Providence, R. I., Savannah, Ga., St. Louis, Mo., Washington, D. C.

APPENDIX F (PART II)

Table 23
Mortality from Cancer in Southern Cities, White
1891-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	891,023	480	53.9
1892	907,130	438	48.3
1893	923,238	512	55.5
1894	939,347	464	49.4
1895	955,456	541	56.6
1891-1895	4,616,194	2,435	52.7
1896	971,566	576	59.3
1897	987,678	563	57.0
1898	1,003,791	570	56.8
1899	1,019,904	613	60.1
1900	1,036,017	615	59.4
1896-1900	5,018,956	2,937	58.5
1901	1,057,588	664	62.8
1902	1,079,160	713	66.1
1903	1,100,732	753	68.4
1904	1,122,305	824	73.4
1905	1,143,880	846	74.0
1901-1905	5,503,665	3,800	69.0
1906	1,165,457	887	76.1
1907	1,187,034	956	80.5
1908	1,208,611	976	80.8
1909	1,230,188	979	79.6
1910	1,251,766	1,107	88.4
1906-1910	6,043,056	4,905	81.2
1911	1,273,338	1,071	84.1
1912	1,294,911	1,159	89.5
1913	1,316,492	1,272	96.6
1914	1,338,076	1,248	93.3

Note: Includes Baltimore, Md., Washington, D. C., New Orleans, La., Charleston, S. C., Memphis, Tenn., Nashville, Tenn., Richmond, Va., Savannah, Ga.

Table 24
Mortality from Cancer in Southern Cities, Colored
1891-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	358,638	144	40.2
1892	365,127	129	35.3
1893	371,576	143	38.5
1894	378,105	143	37.8
1895	384,595	167	43.4
1891-1895	1,858,041	726	39.1
1896	391,087	141	36.1
1897	397,577	152	38.2
1898	404,066	165	40.8
1899	410,557	195	47.5
1900	417,048	197	47.2
1896-1900	2,020,335	850	42.1
1901	422,319	217	51.4
1902	427,610	193	45.1
1903	432,893	206	47.6
1904	438,175	232	52.9
1905	443,456	239	53.9
1901-1905	2,164,453	1,087	50.2
1906	448,736	247	55.0
1907	454,016	280	61.7
1908	459,296	265	57.7
1909	464,576	261	56.2
1910	469,857	257	54.7
1906-1910	2,296,481	1,310	57.0
1911	475,138	296	62.3
1912	480,419	340	70.8
1913	485,699	357	73.5
1914	490,978	368	75.0

Note: Includes Baltimore, Md., Washington, D. C., New Orleans, La., Charleston, S. C., Memphis, Tenn., Nashville, Tenn., Richmond, Va., Savannah, Ga.

APPENDIX F (PART II)

Table 25
Mortality from Cancer in Augusta, Ga.
1891-1913

Year (Ending Nov. 30)	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	33,914	8	23.6	1906	40,400	19	47.0
1892	34,528	11	31.9	1907	40,560	13	32.1
1893	35,142	11	31.3	1908	40,720	24	58.9
1894	35,756	14	39.2	1909	40,880	20	48.9
1895	36,370	19	52.2	1910	41,040	24	58.5
1891-1895	175,710	63	35.9	1906-1910	203,600	100	49.1
1896	36,984	11	29.7	1911	41,200	33	80.1
1897	37,598	17	45.2	1912	41,360	23	55.6
1898	38,212	19	49.7	1913	41,520	32	77.1
1899	38,826	17	43.8				
1900	39,441	16	40.6				
1896-1900	191,061	80	41.9				
1901	39,600	17	42.9				
1902	39,760	14	35.2				
1903	39,920	19	47.6				
1904	40,080	16	39.9				
1905	40,240	24	59.6				
1901-1905	199,600	90	45.1				

Source: Annual Reports of the Board of Health of Augusta, Ga.

Table 26
Mortality from Cancer in Augusta, Ga., Males
1891-1912

Year (Ending Nov. 30)	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	15,606	3	19.2	1906	18,831	6	31.9
1892	15,897	4	25.2	1907	18,932	1	5.3
1893	16,188	4	24.7	1908	19,033	6	31.5
1894	16,479	0	..	1909	19,135	3	15.7
1895	16,770	2	11.9	1910	19,237	7	36.4
1891-1895	80,940	13	16.1	1906-1910	95,168	23	24.2
1896	17,061	1	5.9	1911	19,339	6	31.0
1897	17,352	3	17.3	1912	19,441	6	30.9
1898	17,643	8	45.3				
1899	17,934	3	16.7				
1900	18,225	2	11.0				
1896-1900	88,215	17	19.3				
1901	18,326	4	21.8				
1902	18,427	2	10.9				
1903	18,528	3	16.2				
1904	18,629	7	37.6				
1905	18,730	9	48.1				
1901-1905	92,640	25	27.0				

Source: Annual Reports of the Board of Health of Augusta, Ga.

APPENDIX F (PART II)

Table 27
Mortality from Cancer in Augusta, Ga., Females
1891-1912

Year (Ending Nov. 30)	Population	Deaths from Cancer	Rate per 100,000 Population
1891	18,308	5	27.3
1892	18,631	7	37.6
1893	18,954	7	36.9
1894	19,277	14	72.6
1895	19,600	17	86.7
1891-1895	94,770	50	52.8
1896	19,923	10	50.2
1897	20,246	14	69.1
1898	20,569	11	53.5
1899	20,892	14	67.0
1900	21,216	14	66.0
1896-1900	102,846	63	61.3
1901	21,274	13	61.1
1902	21,333	12	56.3
1903	21,392	16	74.8
1904	21,451	9	42.0
1905	21,510	15	69.7
1901-1905	106,960	65	60.8
1906	21,569	13	60.3
1907	21,628	12	55.5
1908	21,687	18	83.0
1909	21,745	17	78.2
1910	21,803	17	78.0
1906-1910	108,432	77	71.0
1911	21,861	27	123.5
1912	21,919	17	77.6

Source: Annual Reports of the Board of Health of Augusta, Ga.

APPENDIX F (PART II)

Table 28

Mortality from Cancer in Baltimore, Md.

1871-1914

Population	Deaths from Cancer	Rate per 100,000 Population
273,849	53	19.4
280,345	48	17.1
286,841	78	27.2
293,337	92	31.4
299,833	127	42.4
1,434,205	398	27.8
306,329	126	41.1
312,825	149	47.6
319,321	149	46.7
325,817	152	46.7
332,313	168	50.6
1,596,605	744	46.6
342,525	175	51.1
352,737	164	46.5
362,949	164	45.2
373,161	183	49.0
383,374	185	48.3
1,814,746	871	48.0
393,587	207	52.6
403,800	230	57.0
414,013	225	54.3
424,226	226	53.3
434,439	276	63.5
2,070,065	1,164	56.2
441,890	267	60.4
449,341	233	51.9
456,793	251	54.9
464,245	266	57.3
471,697	302	64.0
2,283,966	1,319	57.8

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1896	479,149	344	71.8
1897	486,601	316	64.9
1898	494,053	331	67.0
1899	501,505	329	65.6
1900	508,957	318	62.5
1896-1900	2,470,265	1,638	66.3
1901	513,909	358	69.7
1902	518,861	384	74.0
1903	523,814	370	70.6
1904	528,767	450	85.1
1905	533,720	437	81.9
1901-1905	2,619,071	1,999	76.3
1906	538,673	450	83.5
1907	543,626	473	87.0
1908	548,579	449	81.8
1909	553,532	450	81.3
1910	558,485	529	94.7
1906-1910	2,742,895	2,351	85.8
1911	563,438	526	93.4
1912	568,391	546	96.1
1913	573,343	602	105.0
1914	578,299	518	89.6

Source: Annual Reports of the Department of Public Safety of the City of Baltimore, Md.

APPENDIX F (PART II)

Table 29
Mortality from Cancer in Baltimore, Md., White
1891-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	373,350	200	53.6
1892	379,557	160	42.2
1893	385,764	190	49.3
1894	391,971	174	44.4
1895	398,178	215	54.0
1891-1895	1,928,820	939	48.7
1896	404,386	250	61.8
1897	410,594	229	55.8
1898	416,802	222	53.3
1899	423,010	245	57.9
1900	429,218	221	51.5
1896-1900	2,084,010	1,167	56.0
1901	433,634	270	62.3
1902	438,051	275	62.8
1903	442,468	285	64.4
1904	446,885	331	74.1
1905	451,302	323	71.6
1901-1905	2,212,340	1,484	67.1
1906	455,719	341	74.8
1907	460,136	347	75.4
1908	464,553	355	76.4
1909	468,970	351	74.8
1910	473,387	420	88.7
1906-1910	2,322,765	1,814	78.1
1911	477,803	410	85.8
1912	482,220	425	88.1
1913	486,637	514	105.6
1914	491,057	438	89.2

Source: Annual Reports of the Department of Public Safety of the City of Baltimore, Md.

Note: This table excludes non-residents.

Table 30
Mortality from Cancer in Baltimore, Md., Colored
1891-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	68,540	24	35.0
1892	69,784	23	33.0
1893	71,029	17	23.9
1894	72,274	22	30.4
1895	73,519	31	42.2
1891-1895	355,146	117	32.9
1896	74,763	26	34.8
1897	76,007	30	39.5
1898	77,251	34	44.0
1899	78,495	35	44.6
1900	79,739	32	40.1
1896-1900	386,255	157	40.6
1901	80,275	29	36.1
1902	80,810	36	44.5
1903	81,346	26	32.0
1904	81,882	44	53.7
1905	82,418	57	69.2
1901-1905	406,731	192	47.2
1906	82,954	51	61.5
1907	83,490	53	63.5
1908	84,026	59	70.2
1909	84,562	52	61.5
1910	85,098	52	61.1
1906-1910	420,130	267	63.6
1911	85,634	55	64.2
1912	86,169	59	68.5
1913	86,706	88	101.5
1914	87,242	80	91.7

Source: Annual Reports of the Department of Public Safety of the City of Baltimore, Md.

Note: This table excludes non-residents.

APPENDIX F (PART II)

Table 31
Mortality from Cancer in Baltimore, Md., by Organs and Parts 1893-1902 Compared with 1903-1912

	1893-1902		1903-1912		
Organ or Part	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population	Percentage of Increase
Buccal cavity	142	2.9	190	3.5	20.7
Stomach and liver	1,230	25.1	1,890	34.6	37.8
Peritoneum, intestines and rectum	199	4.1	463	8.5	107.3
Female generative organs	710	14.5	806	14.8	2.1
Breast	381	7.8	460	8.4	7.7
Skin	78	1.6	137	2.5	56.3
Other or not specified organs	459	9.3	734	13.4	44.1
All organs	3,199	65.3	4,680	85.7	31.2

Source: Annual Reports of the Health Department of the City of Baltimore, Md.

Table 32
Mortality from Cancer in Boston, Mass. 1881-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	368,349	241	65.4	1901	567,789	455	80.1
1882	373,860	253	67.7	1902	574,686	482	83.9
1883	379,371	293	77.2	1903	581,583	511	87.9
1884	384,882	282	73.3	1904	588,481	565	96.0
1885	390,393	274	70.2	1905	595,380	628	105.5
1881-1885	1,896,855	1,343	70.8	1901-1905	2,907,919	2,641	90.8
1886	402,009	299	74.4	1906	610,420	580	95.0
1887	413,626	324	78.3	1907	625,461	611	97.7
1888	425,243	279	65.6	1908	640,502	628	98.0
1889	436,860	306	70.0	1909	655,543	670	102.2
1890	448,477	326	72.7	1910	670,585	693	103.3
1886-1890	2,126,215	1,534	72.1	1906-1910	3,202,511	3,182	99.4
1891	458,165	317	69.2	1911	685,627	769	112.2
1892	467,853	328	70.1	1912	700,669	785	112.0
1893	477,542	307	64.3	1913	715,711	841	117.5
1894	487,231	354	72.7	1914	730,753	876	119.9
1895	496,920	391	78.7				
1891-1895	2,387,711	1,697	71.1				
1896	509,714	389	76.3				
1897	522,508	400	76.6				
1898	535,302	412	77.0				
1899	548,097	402	73.3				
1900	560,892	452	80.6				
1896-1900	2,676,513	2,055	76.8				

Source: Annual Reports of the Board of Health of the City of Boston, Mass., Annual Reports of the Registry Department of the City of Boston, Mass.

APPENDIX F (PART II)

Table 33
Mortality from Cancer in Boston, Mass., Males
1881-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	175,371	89	50.7
1882	177,995	72	40.5
1883	180,616	98	54.3
1884	183,399	94	51.3
1885	186,182	75	40.3
1881-1885	903,563	428	47.4
1886	192,496	82	42.6
1887	198,810	87	43.8
1888	205,124	85	41.4
1889	211,439	90	42.6
1890	217,754	105	48.2
1886-1890	1,025,623	449	43.8
1891	222,136	93	41.9
1892	226,518	99	43.7
1893	230,900	97	42.0
1894	235,283	116	49.3
1895	239,666	120	50.1
1891-1895	1,154,503	525	45.5
1896	246,717	137	55.5
1897	253,768	135	53.2
1898	260,819	122	46.8
1899	267,870	125	46.7
1900	274,922	168	61.1
1896-1900	1,304,096	687	52.7
1901	277,999	147	52.9
1902	281,076	146	51.9
1903	284,153	188	66.2
1904	287,231	199	69.3
1905	290,309	226	77.8
1901-1905	1,420,768	906	63.8
1906	298,187	217	72.8
1907	306,066	219	71.6
1908	313,945	236	75.2
1909	321,824	259	80.5
1910	329,703	257	77.9
1906-1910	1,569,725	1,188	75.7
1911	337,582	271	80.3
1912	345,461	270	78.2
1913	353,340	345	97.6

Source: Annual Reports of the Board of Health of the City of Boston, Mass., Annual Reports of the Registry Department of the City of Boston, Mass.

APPENDIX F (PART II)

Table 34

Mortality from Cancer in Boston, Mass., Females

1881-1913

·	Population	Deaths from Cancer	Rate per 100,000 Population
l	192,978	152	78.8
ℓ	195,865	181	92.4
3	198,755	195	98.1
l	201,483	188	93.3
5	204,211	199	97.4
885	993,292	915	92.1
3	209,513	217	103.6
r	214,816	237	110.3
3	220,119	194	88.1
)	225,421	216	95.8
)	230,723	221	95.8
890	1,100,592	1,085	98.6
l	236,029	224	94.9
ℓ	241,335	229	94.9
3	246,642	210	85.1
l	251,948	238	94.5
5	257,254	271	105.3
895	1,233,208	1,172	95.0
3	262,997	252	95.8
r	268,740	265	98.6
3	274,483	290	105.7
)	280,227	277	98.8
)	285,970	284	99.3
900	1,372,417	1,368	99.7
l	289,790	308	106.3
ℓ	293,610	336	114.4
3	297,430	323	108.6
l	301,250	366	121.5
5	305,071	402	131.8
905	1,487,151	1,735	116.7

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	312,233	363	116.3
1907	319,395	392	122.7
1908	326,557	392	120.0
1909	333,719	411	123.2
1910	340,882	436	127.9
1906-1910	1,632,786	1,994	122.1
1911	348,045	498	143.1
1912	355,208	515	145.0
1913	362,371	496	136.9

Source: Annual Reports of the Board of Health of the City of Boston, Mass., Annual Reports of the Registry Department of the City of Boston, Mass.

APPENDIX F (PART II)

Table 35
Mortality from Cancer in Boston, Mass., by Age and Sex 1903-1912

Ages	MALES Deaths from Cancer	MALES Rate per 100,000 Population	FEMALES Deaths from Cancer	FEMALES Rate per 100,000 Population
Under 20	50	4.6	54	4.9
20–29	51	8.2	62	9.3
30–39	137	23.9	356	61.6
40–49	362	88.1	801	198.1
50–59	621	262.7	1,068	428.1
60 and over	1,121	628.6	1,757	745.5
All ages	2,342	75.2	4,098	126.5

Source: Annual Reports of the Registry Department of the City of Boston, Mass.

Table 36
Mortality from Cancer in Boston, Mass., by Organs and Parts according to Sex, 1903-1912

Organ or Part	TOTAL Deaths from Cancer	TOTAL Rate per 100,000 Population	MALES Deaths from Cancer	MALES Rate per 100,000 Population	FEMALES Deaths from Cancer	FEMALES Rate per 100,000 Population
Buccal cavity	308	4.9	248	8.0	60	1.9
Stomach and liver	2,027	31.9	918	29.5	1,109	34.2
Peritoneum, intestines, rectum	1,127	17.7	446	14.3	681	21.0
Female generative organs	921	14.5	..	..	921	28.4
Breast	657	10.3	7	0.2	650	20.1
Skin	82	1.3	44	1.4	38	1.2
Other or not specified organs	1,318	20.7	679	21.8	639	19.7
All organs	6,440	101.3	2,342	75.2	4,098	126.5

Source: Annual Reports of the Registry Department of the City of Boston, Mass.

Table 37

Mortality from Cancer in Boston, Mass., by Organs and Parts according to Age, Males, 1903-1912

Organ or Part	Under 20	20-29	30-39	40-49	50-59	60 and over
NUMBER OF DEATHS						
l cavity	1	1	3	39	75	129
ch and liver	3	7	50	144	264	450
neum, intestines and rectum	11	13	33	70	113	206
t	..	..	..	1	2	4
	..	..	5	6	6	27
or not specified organs	35	30	46	102	161	305
gans	50	51	137	362	621	1,121
RATE PER 100,000 POPULATION						
l cavity	0.1	0.2	0.5	9.5	31.7	72.3
ch and liver	0.3	1.1	8.7	35.1	111.7	252.3
neum, intestines and rectum	1.0	2.1	5.8	17.0	47.8	115.5
:	..	..	..	0.2	0.8	2.2
	..	..	0.9	1.5	2.5	15.1
or not specified organs	3.2	4.8	8.0	24.8	68.2	171.2
gans	4.6	8.2	23.9	88.1	262.7	628.6

urce: Annual Reports of the Registry Department of the City of Boston, Mass.

Table 38

Mortality from Cancer in Boston, Mass., by Organs and Parts according to Age, Females, 1903-1912

Organ or Part	Under 20	20-29	30-39	40-49	50-59	60 and over
NUMBER OF DEATHS						
l cavity	4	1	4	10	13	28
ch and liver	4	6	65	170	291	573
neum, intestines and rectum	13	15	38	115	157	343
ative organs	1	19	124	235	293	249
:	..	3	62	146	170	269
	1	..	2	3	4	28
or not specified organs	31	18	61	122	140	267
gans	54	62	356	801	1,068	1,757
RATE PER 100,000 POPULATION						
l cavity	0.4	0.2	0.7	2.5	5.2	11.9
ch and liver	0.4	0.9	11.3	42.0	116.7	243.1
neum, intestines and rectum	1.2	2.3	6.6	28.4	62.9	145.5
ative organs	0.1	2.9	21.5	58.1	117.5	105.7
:	..	0.5	10.7	36.1	68.1	114.1
	0.1	..	0.3	0.7	1.6	11.9
or not specified organs	2.7	2.5	10.5	30.3	56.1	113.3
gans	4.9	9.3	61.6	198.1	428.1	745.5

urce: Annual Reports of the Registry Department of the City of Boston, Mass.

APPENDIX F (PART II)

Table 39
Mortality from Cancer in Brooklyn, N. Y.
1871-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1871	413,155	155	37.5
1872	430,211	147	34.2
1873	447,267	170	38.0
1874	464,323	197	42.4
1875	481,379	201	41.8
1871-1875	2,236,335	870	38.9
1876	498,435	195	39.1
1877	515,492	200	38.8
1878	532,549	233	43.8
1879	549,606	231	42.0
1880	566,663	221	39.0
1876-1880	2,662,745	1,080	40.6
1881	590,631	254	43.0
1882	614,599	285	46.4
1883	638,567	262	41.0
1884	662,535	323	48.8
1885	686,503	301	43.8
1881-1885	3,192,835	1,425	44.6
1886	710,471	293	41.2
1887	734,439	349	47.5
1888	758,407	345	45.5
1889	782,375	320	40.9
1890	806,343	414	51.3
1886-1890	3,792,035	1,721	45.4
1891	842,366	416	49.4
1892	878,390	538	61.2
1893	914,414	441	48.2
1894	950,438	457	48.1
1895	986,462	572	58.0
1891-1895	4,572,070	2,424	53.0
1896	1,022,486	534	52.2
1897	1,058,510	561	53.0
1898	1,094,534	632	57.7
1899	1,130,558	701	62.0
1900	1,166,582	695	59.6
1896-1900	5,472,670	3,123	57.1
1901	1,213,358	760	62.
1902	1,260,135	791	62.
1903	1,306,912	778	59.
1904	1,353,688	817	60.
1905	1,400,465	899	64.
1901-1905	6,534,558	4,045	61.
1906	1,447,242	975	67.
1907	1,494,019	993	66.
1908	1,540,796	1,016	65.
1909	1,587,573	1,110	69.
1910	1,634,351	1,212	74.
1906-1910	7,703,981	5,306	68.
1911	1,681,129	1,221	72.
1912	1,727,907	1,252	72.
1913	1,774,685	1,346	75.

Source: 1871-1897, Annual Reports the Board of Health of the City of Brookl N. Y., 1898-1912, Annual Reports of t Board of Health of the City of New Yo N. Y., 1913, Report of New York St Department of Health.

APPENDIX F (PART II)

Table 40
Mortality from Cancer in Brooklyn, N. Y., Males
1872-1878 and 1903-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1872	206,682	31	15.0
1873	215,009	50	23.3
1874	223,336	64	28.7
1875	231,663	63	27.2
1876	239,990	60	25.0
1877	248,318	57	23.0
1878	256,646	72	28.1
1872-1878	1,621,644	397	24.5
1903	644,549	293	45.5
1904	668,155	297	44.5
1905	691,761	313	45.2
1906	715,367	343	47.9
1907	738,973	403	54.5
1908	762,579	335	43.9
1909	786,185	414	52.7
1910	809,791	438	54.1
1906-1910	3,812,895	1,933	50.7
1911	833,397	479	57.5
1912	857,003	492	57.4
1913	880,609	534	60.6

Source: 1872-1878, Annual Reports of the Board of Health of the City of Brooklyn, N. Y., 1903-1913, Annual Reports of the Board of Health of the City of New York, N. Y.

Table 41
Mortality from Cancer in Brooklyn, N. Y., Females
1872-1878 and 1903-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1872	223,529	116	51.9
1873	232,258	120	51.7
1874	240,987	133	55.2
1875	249,716	138	55.3
1876	258,445	135	52.2
1877	267,174	143	53.5
1878	275,903	161	58.4
1872-1878	1,748,012	946	54.1
1903	662,363	485	73.2
1904	685,533	520	75.9
1905	708,704	586	82.7
1906	731,875	632	86.4
1907	755,046	590	78.1
1908	778,217	681	87.5
1909	801,388	696	86.8
1910	824,560	774	93.9
1906-1910	3,891,086	3,373	86.7
1911	847,732	742	87.5
1912	870,904	760	87.3
1913	894,076	812	90.8

Source: 1872-1878, Annual Reports of the Board of Health of the City of Brooklyn, N. Y., 1903-1913, Annual Reports of the Board of Health of the City of New York, N. Y.

APPENDIX F (PART II)

Table 42
Mortality from Cancer in Buffalo, N. Y.
1886-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1886	209,329	78	37.3
1887	220,041	102	46.4
1888	231,307	110	47.6
1889	232,491	104	44.7
1890	255,664	132	51.6
1886-1890	1,148,832	526	45.8
1891	263,981	119	45.1
1892	278,727	114	40.9
1893	281,435	138	49.0
1894	290,590	156	53.7
1895	300,043	133	44.3
1891-1895	1,414,776	660	46.7
1896	309,803	166	53.6
1897	319,881	188	58.8
1898	330,287	214	64.8
1899	341,031	207	60.7
1900	352,387	234	66.4
1896-1900	1,653,389	1,009	61.0
1901	357,227	264	73.9
1902	362,067	230	63.5
1903	366,907	271	73.9
1904	371,747	271	72.9
1905	376,587	329	87.4
1901-1905	1,834,535	1,365	74.4
1906	386,012	328	85.0
1907	395,437	323	81.7
1908	404,863	326	80.5
1909	414,289	327	78.9
1910	423,715	396	93.5
1906-1910	2,024,316	1,700	84.0
1911	433,141	420	97.0
1912	442,567	410	92.6
1913	451,993	451	99.8

Source: Annual Reports of the Department of Health of the City of Buffalo, N. Y.

Table 43
Mortality from Cancer in Buffalo, N. Y., by Sex
1904-1905 and 1908-1913

MALES				FEMALES			
Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1904	185,289	107	57.7	1904	186,458	164	88.0
1905	187,879	141	75.0	1905	188,708	188	99.6
1908	202,652	146	72.0	1908	202,211	180	89.0
1909	207,577	121	58.3	1909	206,712	206	99.7
1910	212,502	155	72.9	1910	211,213	241	114.1
1911	217,427	170	78.2	1911	215,714	250	115.9
1912	222,352	170	76.5	1912	220,215	240	109.0
1913	227,277	189	83.2	1913	224,716	262	116.6

Source: Annual Reports of the Department of Health of the City of Buffalo, N. Y.

APPENDIX F (PART II)

Table 44
Mortality from Cancer in Charleston, S. C.
1881-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	50,481	18	35.7
1882	50,978	22	43.2
1883	51,475	22	42.7
1884	51,972	27	52.0
1885	52,469	28	53.4
1881-1885	257,375	117	45.5
1886	52,966	33	62.3
1887	53,463	15	28.1
1888	53,960	23	42.6
1889	54,457	26	47.7
1890	54,955	26	47.3
1886-1890	269,801	123	45.6
1891	55,040	30	54.5
1892	55,125	26	47.2
1893	55,210	30	54.3
1894	55,295	26	47.0
1895	55,380	34	61.4
1891-1895	276,050	146	52.9
1896	55,465	34	61.3
1897	55,550	26	46.8
1898	55,635	19	34.2
1899	55,721	54	96.9
1900	55,807	35	62.7
1896-1900	278,178	168	60.4
1901	56,109	33	58.8
1902	56,411	30	53.2
1903	56,713	29	51.1
1904	57,015	27	47.4
1905	57,318	30	52.3
1901-1905	283,566	149	52.5
1906	57,621	24	41.7
1907	57,924	40	69.1
1908	58,227	24	41.2
1909	58,530	32	54.7
1910	58,833	36	61.2
1906-1910	291,135	156	53.6
1911	59,135	46	77.8
1912	59,437	35	58.9
1913	59,739	41	68.6
1914	60,041	34	56.6

Source: Year Books of the City of Charleston, S. C.

APPENDIX F (PART II)

Table 45
Mortality from Cancer in Charleston, S. C., White
1881-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	22,821	11	48.2
1882	22,943	12	52.3
1883	23,065	9	39.0
1884	23,187	11	47.4
1885	23,309	13	55.8
1881-1885	115,325	56	48.6
1886	23,431	18	76.8
1887	23,553	6	25.5
1888	23,675	15	63.4
1889	23,797	18	75.6
1890	23,919	14	58.5
1886-1890	118,375	71	60.0
1891	23,950	16	66.8
1892	23,982	13	54.2
1893	24,014	16	66.6
1894	24,046	13	54.1
1895	24,078	15	62.3
1891-1895	120,070	73	60.8
1896	24,110	21	87.1
1897	24,142	15	62.1
1898	24,174	10	41.4
1899	24,206	34	140.5
1900	24,238	20	82.5
1896-1900	120,870	100	82.7
1901	24,590	18	73.2
1902	24,942	13	52.1
1903	25,294	17	67.2
1904	25,646	13	50.7
1905	25,999	18	69.2
1901-1905	126,471	79	62.5
1906	26,352	20	75.[illegible]
1907	26,705	18	67.[illegible]
1908	27,058	20	73.[illegible]
1909	27,411	18	65.[illegible]
1910	27,764	23	82.[illegible]
1906-1910	135,290	99	73.[illegible]
1911	28,116	24	85.[illegible]
1912	28,468	24	84.[illegible]
1913	28,820	25	86.[illegible]
1914	29,172	22	75.[illegible]

Source: Year Books of the City Charleston, S. C.

APPENDIX F (PART II)

Table 46
Mortality from Cancer in Charleston, S. C., Colored
1881-1914

	Population	Deaths from Cancer	Rate per 100,000 Population
	27,660	7	25.3
	28,035	10	35.7
	28,410	13	45.8
	28,785	16	55.6
	29,160	15	51.4
5	142,050	61	42.9
	29,535	15	50.8
	29,910	9	30.1
	30,285	8	26.4
	30,660	8	26.1
	31,036	12	38.7
0	151,426	52	34.3
	31,090	14	45.0
	31,143	13	41.7
	31,196	14	44.9
	31,249	13	41.6
	31,302	19	60.7
5	155,980	73	46.8
	31,355	13	41.5
	31,408	11	35.0
	31,461	9	28.6
	31,515	20	63.5
	31,569	15	47.5
0	157,308	68	43.2
	31,519	15	47.6
	31,469	17	54.0
	31,419	12	38.2
	31,369	14	44.6
	31,319	12	38.3
5	157,095	70	44.6

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	31,269	4	12.8
1907	31,219	22	70.5
1908	31,169	4	12.8
1909	31,119	14	45.0
1910	31,069	13	41.8
1906-1910	155,845	57	36.6
1911	31,019	22	70.9
1912	30,969	11	35.5
1913	30,919	16	51.7
1914	30,869	12	38.9

Source: Year Books of the City of Charleston, S. C.

APPENDIX F (PART II)

Table 47
Mortality from Cancer in Chicago, Ill.
1871-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1871	319,397	68	21.3
1872	339,817	75	22.1
1873	360,238	107	29.7
1874	380,659	110	28.9
1875	401,080	123	30.7
1871-1875	1,801,191	483	26.8
1876	421,501	122	28.9
1877	441,922	130	29.4
1878	462,343	177	38.3
1879	482,764	177	36.7
1880	503,185	163	32.4
1876-1880	2,311,715	769	33.3
1881	562,851	217	38.6
1882	622,517	220	35.3
1883	682,183	232	34.0
1884	741,849	265	35.7
1885	801,515	249	31.1
1881-1885	3,410,915	1,183	34.7
1886	861,182	230	26.7
1887	920,849	301	32.7
1888	980,516	361	36.8
1889	1,040,183	379	36.4
1890	1,099,850	461	41.9
1886-1890	4,902,580	1,732	35.3
1891	1,159,722	546	47.1
1892	1,219,594	546	44.8
1893	1,279,466	617	48.2
1894	1,339,338	640	47.8
1895	1,399,210	682	48.7
1891-1895	6,397,330	3,031	47.4
1896	1,459,083	734	50.3
1897	1,518,956	773	50.9
1898	1,578,829	893	56.6
1899	1,638,702	985	60.1
1900	1,698,575	986	58.0
1896-1900	7,894,145	4,371	55.4
1901	1,747,245	1,097	62.8
1902	1,795,915	1,169	65.1
1903	1,844,586	1,172	63.5
1904	1,893,257	1,203	63.5
1905	1,941,928	1,280	65.9
1901-1905	9,222,931	5,921	64.2
1906	1,990,599	1,430	71.8
1907	2,039,270	1,538	75.4
1908	2,087,941	1,571	75.2
1909	2,136,612	1,646	77.0
1910	2,185,283	1,804	82.6
1906-1910	10,439,705	7,989	76.5
1911	2,233,953	1,799	80.5
1912	2,282,623	1,798	78.8
1913	2,331,293	2,004	86.0

Source: Annual Reports of the Department of Health of Chicago, Ill. 1910-1913 United States Mortality Statistics.

APPENDIX F (PART II)

Table 48
Mortality from Cancer in Chicago, Ill., Males
1895-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1895	715,903	288	40.2	1906	1,020,820	660	64.7
				1907	1,047,056	663	63.3
1896	745,404	335	44.9	1908	1,073,292	685	63.8
1897	774,905	323	41.7	1909	1,099,528	726	66.0
1898	804,406	369	45.9	1910	1,125,764	768	68.2
1899	833,907	428	51.3				
1900	863,408	423	49.0	1906-1910	5,366,460	3,502	65.3
1896-1900	4,022,030	1,878	46.7	1911	1,152,000	757	65.7
				1912	1,178,236	777	65.9
1901	889,643	463	52.0	1913	1,204,472	851	70.7
1902	915,878	482	52.6				
1903	942,113	542	57.5				
1904	968,348	504	52.0				
1905	994,584	576	57.9				
1901-1905	4,710,566	2,567	54.5				

Source: Annual Reports of the Department of Health of Chicago, Ill. 1910-1913, United States Mortality Statistics.

Table 49
Mortality from Cancer in Chicago, Ill., Females
1895-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1895	683,307	394	57.7	1906	969,779	770	79.4
				1907	992,214	875	88.2
1896	713,679	399	55.9	1908	1,014,649	886	87.3
1897	744,051	450	60.5	1909	1,037,084	920	88.7
1898	774,423	524	67.7	1910	1,059,519	1,036	97.8
1899	804,795	557	69.2				
1900	835,167	563	67.4	1906-1910	5,073,245	4,487	88.4
1896-1900	3,872,115	2,493	64.4	1911	1,081,953	1,042	96.3
				1912	1,104,387	1,021	92.4
1901	857,602	634	73.9	1913	1,126,821	1,153	102.3
1902	880,037	687	78.1				
1903	902,473	630	69.8				
1904	924,909	699	75.6				
1905	947,344	704	74.3				
1901-1905	4,512,365	3,354	74.3				

Source: Annual Reports of the Department of Health of Chicago, Ill. 1910-1913, United States Mortality Statistics.

Table 50

Mortality from Cancer in Chicago, Ill., by Organs and Parts according to Sex, 1903-1912

Organ or Part	TOTAL Deaths from Cancer	TOTAL Rate per 100,000 Population	MALES Deaths from Cancer	MALES Rate per 100,000 Population	FEMALES Deaths from Cancer	FEMALES Rate per 100,000 Population
Buccal cavity	388	1.9	334	3.2	54	0.5
Stomach and liver	6,542	31.7	3,617	34.1	2,925	29.2
Peritoneum, intestines, rectum	1,611	7.8	725	6.8	886	8.8
Female generative organs	2,440	11.8	..	..	2,440	24.3
Breast	1,128	5.5	5	0.0	1,123	11.2
Skin	212	1.0	122	1.2	90	0.9
Other or not specified organs	2,920	14.2	1,855	17.5	1,065	10.6
All organs	15,241	73.9	6,658	62.8	8,583	85.5

Source: Annual Reports of the Department of Health of the City of Chicago, Ill.

Table 51

Mortality from Cancer in Cincinnati, Ohio 1871-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1871	220,129	49	22.3	1896	314,302	209	66.5
1872	224,019	66	29.5	1897	317,202	189	59.6
1873	227,909	61	26.8	1898	320,102	195	60.9
1874	231,799	66	28.5	1899	323,002	205	63.5
1875	235,689	79	33.5	1900	325,902	198	60.8
1871-1875	1,139,545	321	28.2	1896-1900	1,600,510	996	62.2
1876	239,579	76	31.7	1901	329,670	223	67.6
1877	243,469	80	32.9	1902	333,439	227	68.1
1878	247,359	66	26.7	1903	337,208	267	79.2
1879	251,249	88	35.0	1904	340,977	250	73.3
1880	255,139	105	41.2	1905	344,746	228	66.1
1876-1880	1,236,795	415	33.6	1901-1905	1,686,040	1,195	70.9
1881	259,315	103	39.7	1906	348,515	376	107.9
1882	263,492	111	42.1	1907	352,284	305	86.6
1883	267,669	115	43.0	1908	356,053	328	92.1
1884	271,846	98	36.1	1909	359,822	344	95.6
1885	276,023	93	33.7	1910	363,591	302	83.1
1881-1885	1,338,345	520	38.9	1906-1910	1,780,265	1,655	93.0
1886	280,200	124	44.3	1911	367,360	354	96.4
1887	284,377	137	48.2	1912	371,129	352	94.8
1888	288,554	154	53.4	1913	374,898	394	105.1
1889	292,731	124	42.4				
1890	296,908	129	43.4				
1886-1890	1,442,770	608	46.3				
1891	299,807	159	53.0				
1892	302,706	148	48.9				
1893	305,605	160	52.4				
1894	308,504	184	59.6				
1895	311,403	152	48.8				
1891-1895	1,528,025	803	52.6				

Source: Annual Reports of the Board of Health of the City of Cincinnati, Ohio.

Table 52

ality from Cancer in Cincinnati Ohio, Males

1891-1913

r	Population	Deaths from Cancer	Rate per 100,000 Population
1	146,223	53	36.2
2	147,436	61	41.4
3	148,649	60	40.4
4	149,862	77	51.4
5	151,075	49	32.4
895	743,245	300	40.4
6	152,288	75	49.2
7	153,501	74	48.2
8	154,714	88	56.9
9	155,927	84	53.9
0	157,140	83	52.8
900	773,570	404	52.2
1	159,177	77	48.4
2	161,214	77	47.8
3	163,251	97	59.4
4	165,288	88	53.2
5	167,325	83	49.6
905	816,255	422	51.7
3	169,362	108	63.8
7	171,399	101	58.9
3	173,436	129	74.4
)	175,473	125	71.2
)	177,511	126	71.0
910	867,181	589	67.9
1	179,549	130	72.4
2	181,587	134	73.8
3	183,625	141	76.8

rce: Annual Reports of the Board lth of the City of Cincinnati, Ohio.

Table 53

Mortality from Cancer in Cincinnati Ohio, Females

1891-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	153,584	106	69.0
1892	155,270	87	56.0
1893	156,956	100	63.7
1894	158,642	107	67.4
1895	160,328	103	64.2
1891-1895	784,780	503	64.1
1896	162,014	134	82.7
1897	163,701	115	70.3
1898	165,388	107	64.7
1899	167,075	121	72.4
1900	168,762	115	68.1
1896-1900	826,940	592	71.6
1901	170,493	146	85.6
1902	172,225	150	87.1
1903	173,957	170	97.7
1904	175,689	162	92.2
1905	177,421	145	81.7
1901-1905	869,785	773	88.9
1906	179,153	268	149.6
1907	180,885	204	112.8
1908	182,617	199	109.0
1909	184,349	219	118.8
1910	186,080	176	94.6
1906-1910	913,084	1,066	116.7
1911	187,811	224	119.3
1912	189,542	218	115.0
1913	191,273	253	132.3

Source: Annual Reports of the Board of Health of the City of Cincinnati, Ohio.

APPENDIX F (PART II)

Table 54
Mortality from Cancer in Cleveland, Ohio
1884-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1884	200,627	78	38.9
1885	210,748	73	34.6
1886	220,869	76	34.4
1887	230,990	100	43.3
1888	241,111	100	41.5
1889	251,232	102	40.6
1890	261,353	111	42.5
1886-1890	1,205,555	489	40.6
1891	273,394	111	40.6
1892	285,435	102	35.7
1893	297,476	150	50.4
1894	309,517	138	44.6
1895	321,558	192	59.7
1891-1895	1,487,380	693	46.6
1896	333,600	165	49.5
1897	345,642	183	52.9
1898	357,684	171	47.8
1899	369,726	184	49.8
1900	381,768	187	49.0
1896-1900	1,788,420	890	49.8
1901	399,657	211	52.8
1902	417,546	196	46.9
1903	435,435	228	52.4
1904	453,324	233	51.4
1905	471,213	269	57.1
1901-1905	2,177,175	1,137	52.2
1906	489,103	290	59.3
1907	506,993	295	58.2
1908	524,883	328	62.5
1909	542,773	333	61.4
1910	560,663	405	72.2
1906-1910	2,624,415	1,651	62.9
1911	578,553	422	72.9
1912	596,443	472	79.1
1913	614,333	489	79.6

Source: Annual Reports of the Public Health Department of the City of Cleveland, Ohio.

Table 55

lity from Cancer in Cleveland Ohio, Males 1885-1913

	Population	Deaths from Cancer	Rate per 100,000 Population
	107,121	30	28.0
	112,210	39	34.8
	..	..	..
	122,373	36	29.4
	127,447	42	33.0
	132,517	44	33.2
90	494,547	161	32.6
	138,527	40	28.9
	144,537	40	27.7
	150,546	56	37.2
	156,556	56	35.8
	162,566	82	50.4
95	752,732	274	36.4
	168,576	80	47.5
	174,586	67	38.4
	180,596	76	42.1
	186,606	85	45.6
	192,616	81	42.1
00	902,980	389	43.1
	202,280	76	37.6
	211,944	86	40.6
	221,608	91	41.1
	231,272	106	45.8
	240,937	120	49.8
05	1,108,041	479	43.2
	250,602	111	44.3
	260,267	114	43.8
	269,932	141	52.2
	279,597	135	48.3
	289,262	160	55.3
10	1,349,660	661	49.0
	298,927	173	57.9
	308,592	204	66.1
	318,257	227	71.3

e: Annual Reports of the Public Department of the City of Cleve- io.

Table 56

Mortality from Cancer in Cleveland Ohio, Females 1885-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1885	103,627	43	41.5
1886	108,659	37	34.1
1887	..	..	..
1888	118,738	64	53.9
1889	123,785	60	48.5
1890	128,836	67	52.0
1886-1890	480,018	228	47.5
1891	134,867	71	52.6
1892	140,898	62	44.0
1893	146,930	94	64.0
1894	152,961	82	53.6
1895	158,992	110	69.2
1891-1895	734,648	419	57.0
1896	165,024	85	51.5
1897	171,056	116	67.8
1898	177,088	95	53.6
1899	183,120	99	54.1
1900	189,152	106	56.0
1896-1900	885,440	501	56.6
1901	197,377	135	68.4
1902	205,602	110	53.5
1903	213,827	137	64.1
1904	222,052	127	57.2
1905	230,276	149	64.7
1901-1905	1,069,134	658	61.5
1906	238,501	179	75.1
1907	246,726	181	73.4
1908	254,951	187	73.3
1909	263,176	198	75.2
1910	271,401	245	90.3
1906-1910	1,274,755	990	77.7
1911	279,626	249	89.0
1912	287,851	268	93.1
1913	296,076	262	88.5

Source: Annual Reports of the Public Health Department of the City of Cleveland, Ohio.

APPENDIX F (PART II)

Table 57

Mortality from Cancer in Cleveland, Ohio, by Organs and Parts according to Sex, 1903-1912

Organ or Part	TOTAL Deaths from Cancer	TOTAL Rate per 100,000 Population	MALES Deaths from Cancer	MALES Rate per 100,000 Population	FEMALES Deaths from Cancer	FEMALES Rate per 100,000 Population
Buccal cavity	47	0.9	36	1.4	11	0.4
Stomach and liver	1,299	25.2	664	25.0	635	25.3
Peritoneum, intestines, rectum	278	5.4	105	4.0	173	6.9
Female generative organs	408	7.9	6	0.2	402	16.0
Breast	173	3.4	5	0.2	168	6.7
Skin	63	1.2	38	1.4	25	1.0
Other or not specified organs	1,007	19.5	501	18.9	506	20.2
All organs	3,275	63.5	1,355	51.1	1,920	76.5

Source: Annual Reports of the Public Health Department of the City of Cleveland, Ohio.

Table 58

Mortality from Cancer in Columbus, Ohio 1900-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	125,560	85	67.7
1901	131,155	66	50.3
1902	136,750	86	62.9
1903	142,345	91	63.9
1904	147,940	101	68.3
1905	153,535	104	67.7
1901-1905	711,725	448	62.9

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	159,130	101	63.5
1907	164,725	102	61.9
1908	170,320	135	79.3
1909	175,915	173	98.3
1910	181,511	166	91.5
1906-1910	851,601	677	79.5
1911	187,106	163	87.1
1912	192,701	186	96.5
1913	198,296	181	91.3

Source: United States Mortality Statistics.

APPENDIX F (PART II)

Table 59
Mortality from Cancer in Dayton, Ohio
1871-1913

	Population	Deaths from Cancer	Rate per 100,000 Population
	31,293	11	35.2
	32,113	11	34.3
	32,933	12	36.4
	33,753	9	26.7
	34,573	9	26.0
375	164,665	52	31.6
	35,394	17	48.0
	36,215	8	22.1
	37,036	11	29.7
	37,857	17	44.9
	38,678	19	49.1
380	185,180	72	38.9
	40,932	18	44.0
	43,186	19	44.0
	45,440	9	19.8
	47,694	15	31.5
	49,948	18	36.0
385	227,200	79	34.8
	52,202	22	42.1
	54,456	25	45.9
	56,710	28	49.4
	58,965	26	44.1
	61,220	28	45.7
390	283,553	129	45.5
	63,631	52	81.7
	66,042	31	46.9
	68,453	33	48.2
	70,864	53	74.8
	73,275	41	56.0
395	342,265	210	61.4

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1896	75,686	46	60.8
1897	78,097	54	69.1
1898	80,509	43	53.4
1899	82,921	55	66.3
1900	85,333	56	65.6
1896-1900	402,546	254	63.1
1901	88,457	66	74.6
1902	91,581	54	59.0
1903	94,705	66	69.7
1904	97,829	66	67.5
1905	100,953	70	69.3
1901-1905	473,525	322	68.0
1906	104,077	95	91.3
1907	107,202	91	84.9
1908	110,327	77	69.8
1909	113,452	119	104.9
1910	116,577	106	90.9
1906-1910	551,635	488	88.5
1911	119,701	111	92.7
1912	122,825	112	91.2
1913	125,949	109	86.5

Source: Annual Reports of the Board of Health of the City of Dayton, Ohio. United States Mortality Statistics, 1909-1913.

APPENDIX F (PART II)

Table 60
Mortality from Cancer in Dayton, Ohio, Males
1876-1908

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1876	17,521	8	45.7
1877	17,935	2	11.2
1878	18,349	8	43.6
1879	18,763	7	37.3
1880	19,177	8	41.7
1876-1880	91,745	33	36.0
1881	20,308	8	39.4
1882	21,439	5	23.3
1883	22,570	1	4.4
1884	23,701	1	4.2
1885	24,832	7	28.2
1881-1885	112,850	22	19.5
1886	25,963	12	46.2
1887	27,094	10	36.9
1888	28,225	8	28.3
1889	29,357	11	37.5
1890	30,489	8	26.2
1886-1890	141,128	49	34.7
1891	31,654	18	56.9
1892	32,819	14	42.7
1893	33,984	13	38.3
1894	35,149	19	54.1
1895	36,314	14	38.6
1891-1895	169,920	78	45.9
1896	37,479	20	53.4
1897	38,644	22	56.9
1898	39,810	20	50.2
1899	40,976	18	43.9
1900	42,142	15	35.6
1896-1900	199,051	95	47.7
1901	43,812	30	68.5
1902	45,482	24	52.8
1903	47,152	27	57.3
1904	48,822	23	47.1
1905	50,493	23	45.6
1901-1905	235,761	127	53.9
1906	52,164	42	80.5
1907	53,835	41	76.2
1908	55,506	27	48.6

Source: Annual Reports of the Board of Health of the City of Dayton, Ohio.

APPENDIX F (PART II)

Table 61
Mortality from Cancer in Dayton, Ohio, Females
1876-1908

	Population	Deaths from Cancer	Rate per 100,000 Population
	17,873	9	50.4
	18,280	6	32.8
	18,687	3	16.1
	19,094	10	52.4
	19,501	11	56.4
0	93,435	39	41.7
	20,624	10	48.5
	21,747	14	64.4
	22,870	8	35.0
	23,993	14	58.4
	25,116	11	43.8
5	114,350	57	49.8
	26,239	10	38.1
	27,362	15	54.8
	28,485	20	70.2
	29,608	15	50.7
	30,731	20	65.1
0	142,425	80	56.2
	31,977	34	106.3
	33,223	17	51.2
	34,469	20	58.0
	35,715	34	95.2
	36,961	27	73.0
5	172,345	132	76.6
	38,207	26	68.1
	39,453	32	81.1
	40,699	23	56.5
	41,945	37	88.2
	43,191	41	94.9
0	203,495	159	78.1

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	44,645	36	80.6
1902	46,099	30	65.1
1903	47,553	39	82.0
1904	49,007	43	87.7
1905	50,460	47	93.1
1901-1905	237,764	195	82.0
1906	51,913	53	102.1
1907	53,367	50	93.7
1908	54,821	50	91.2

Source: Annual Reports of the Board of Health of the City of Dayton, Ohio.

APPENDIX F (PART II)

Table 62
Mortality from Cancer in Denver, Colo.
1892-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1892	112,141	25	22.3
1893	114,855	48	41.8
1894	117,569	43	36.6
1895	120,284	52	43.2
1892-1895	464,849	168	36.1
1896	122,999	62	50.4
1897	125,714	77	61.3
1898	128,429	71	55.3
1899	131,144	86	65.6
1900	133,859	68	50.8
1896-1900	642,145	364	56.7
1901	141,811	101	71.2
1902	149,763	85	56.8
1903	157,715	88	55.8
1904	..	..	..
1905	173,618	119	68.5
1901-1905	622,907	393	63.1

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	181,570	133	73.2
1907	189,522	115	60.7
1908	197,475	159	80.5
1909	205,428	171	83.2
1910	213,381	191	89.5
1906-1910	987,376	769	77.9
1911	221,334	166	75.0
1912	229,287	200	87.2
1913	237,240	181	76.3

Source: Annual Reports of the Board of Health of the City of Denver, Colo., 1899-1903, Monthly Reports of the Board of Health of the City of Denver, Colo.

Table 63
Mortality from Cancer in Denver, Colo., by Sex
1905-1913

MALES

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1905	86,992	39	44.8
1906	91,072	50	54.9
1907	95,152	53	55.7
1908	99,233	68	68.5
1909	103,314	68	65.8
1910	107,395	74	68.9
1906-1910	496,166	313	63.1
1911	111,476	73	65.5
1912	115,557	84	72.7
1913	119,638	68	56.8

FEMALES

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1905	86,626	80	92.4
1906	90,498	83	91.7
1907	94,370	62	65.7
1908	98,242	91	92.6
1909	102,114	103	100.9
1910	105,986	117	110.4
1906-1910	491,210	456	92.8
1911	109,858	93	84.7
1912	113,730	116	102.0
1913	117,602	113	96.1

Source: Annual Reports of the Board of Health of the City of Denver, Colo.

APPENDIX F (PART II)

Table 64
Mortality from Cancer in Denver, Colo., by Organs and Parts according to Sex, 1905-1912

Organ or Part	TOTAL		MALES		FEMALES	
	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population
Buccal cavity	38	2.4	33	4.1	5	0.6
Stomach and liver	458	28.4	253	31.2	205	25.6
Peritoneum, intestines, rectum	157	9.7	80	9.9	77	9.6
Female generative organs	229	14.2	..	..	229	28.6
Breast	98	6.1	1	0.1	97	12.1
Skin	25	1.6	14	1.7	11	1.4
Other or not specified organs	249	15.4	128	15.8	121	15.1
All organs	1,254	77.8	509	62.8	745	93.0

Source: Annual Reports of the Health Department of the City of Denver, Colo.

Table 65
Mortality from Cancer in Detroit, Mich. 1883-1913

Year (Ending June 30)	Population	Deaths from Cancer	Rate per 100,000 Population
1883	128,596	50	38.9
1884	132,956	52	39.1
1886	153,818	83	54.0
1887	165,447	89	53.8
1888	177,955	90	50.6
1889	..	..	..
1890	205,876	88	42.7
1886-1890	703,096	350	49.8
1891	213,432	109	51.1
1892	221,265	94	42.5
1893	..	..	..
1894	237,798	103	43.3
1891-1894	672,495	306	45.5
1896	252,796	162	64.1
1897	260,645	163	62.5
1898	268,738	158	58.8
1899	277,082	158	57.0
1900	285,704	179	62.7
1896-1900	1,344,965	820	61.0
1901	293,675	180	61.3
1902	301,647	194	64.3
1903	309,619	224	72.3
1904	317,591	237	74.6
1905	342,286	200	58.4
1901-1905	1,564,818	1,035	66.1
1906	366,982	272	74.1
1907	391,678	240	61.3
1908	416,374	251	60.3
1909	441,070	266	60.3
1910	465,766	314	67.4
1906-1910	2,081,870	1,343	64.5
1911	490,461	313	63.8
1912	515,156	332	64.4
1913	539,851	327	60.6

Source: Annual Reports of the Board of Health of the City of Detroit, Mich., United States Mortality Statistics, 1908.

Note: 1894 and 1908 are calendar years.

APPENDIX F (PART II)

Table 66
Mortality from Cancer in Hartford, Conn.
1881-1913

Year (Fiscal)	Population	Deaths from Cancer	Rate per 100,000 Population
1881	43,136	28	64.9
1882	44,257	20	45.2
1883	45,378	24	52.9
1884	46,499	31	66.7
1885	47,620	26	54.6
1881-1885	226,890	129	56.9
1886	48,742	20	41.0
1887	49,864	30	60.2
1888	50,986	29	56.9
1889	52,108	21	40.3
1890	53,230	39	73.3
1886-1890	254,930	139	54.5
1891	55,892	29	51.9
1892	58,554	31	52.9
1893	61,216	28	45.7
1894	63,878	24	37.6
1895	66,540	40	60.1
1891-1895	306,080	152	49.7
1896	69,202	39	56.4
1897	71,864	42	58.4
1898	74,526	41	55.0
1899	77,188	43	55.7
1900	79,850	50	62.6
1896-1900	372,630	215	57.7
1901	81,756	67	82.0
1902	83,662	38	45.4
1903	85,568	70	81.8
1904	87,474	73	83.5
1905	89,380	82	91.7
1901-1905	427,840	330	77.1
1906	91,287	70	76.[illegible]
1907	93,194	98	105.[illegible]
1908	95,101	77	81.[illegible]
1909	97,008	98	101.[illegible]
1910	98,915	94	95.[illegible]
1906-1910	475,505	437	91.[illegible]
(Calendar)			
1911	100,821	95	94.[illegible]
1912	102,727	118	114.[illegible]
1913	104,633	133	127.[illegible]

Source: Annual reports of the Board of Health of the City of Hartford, Conn.

Note: Data for 1881-1910 are for fiscal years ending February 28th of following year.

Table 67

ty from Cancer in Hartford, Conn., Males

1886-1913

	Population	Deaths from Cancer	Rate per 100,000 Population
	23,835	7	29.4
	24,381	10	41.0
	24,927	6	24.1
	25,473	9	35.3
	26,019	6	23.1
)	124,635	38	30.5
	27,486	7	25.5
	28,953	11	38.0
	30,420	8	26.3
	31,887	7	22.0
	33,355	14	42.0
5	152,101	47	30.9
	34,823	15	43.1
	36,291	16	44.1
	37,759	11	29.1
	39,227	14	35.7
	40,695	14	34.4
)	188,795	70	37.1
	41,546	25	60.2
	42,397	15	35.4
	43,248	28	64.7
	44,099	30	68.0
	44,951	28	62.3
5	216,241	126	58.3
	45,803	37	80.8
	46,655	34	72.9
	47,507	35	73.7
	48,359	38	78.6
	49,211	26	52.8
)	237,535	170	71.6
	50,063	35	69.9
	50,915	51	100.2
	51,767	59	114.0

: Annual Reports of the Board of the City of Hartford, Conn.
Data for 1886-1910 are for fiscal ling February 28th of following

Table 68

Mortality from Cancer in Hartford, Conn., Females

1886-1913

Year (Fiscal)	Population	Deaths from Cancer	Rate per 100,000 Population
1886	24,907	13	52.2
1887	25,483	20	78.5
1888	26,059	23	88.3
1889	26,635	12	45.1
1890	27,211	33	121.3
1886-1890	130,295	101	77.5
1891	28,406	22	77.4
1892	29,601	20	67.6
1893	30,796	20	64.9
1894	31,991	17	53.1
1895	33,185	26	78.3
1891-1895	153,979	105	68.2
1896	34,379	24	69.8
1897	35,573	26	73.1
1898	36,767	30	81.6
1899	37,961	29	76.4
1900	39,155	36	91.9
1896-1900	183,835	145	78.9
1901	40,210	42	104.5
1902	41,265	23	55.7
1903	42,320	42	99.2
1904	43,375	43	99.1
1905	44,429	54	121.5
1901-1905	211,599	204	96.4
1906	45,484	33	72.6
1907	46,539	64	137.5
1908	47,594	42	88.2
1909	48,649	60	123.3
1910	49,704	68	136.8
1906-1910	237,970	207	112.2
(Calendar)			
1911	50,758	60	118.2
1912	51,812	67	129.3
1913	52,866	74	140.0

Source: Annual Reports of the Board of Health of the City of Hartford, Conn.
Note: Data for 1886-1910 are for fiscal years ending February 28th of following year.

Table 69
Mortality from Cancer in Hoboken, N. J., 1880-1913

Year (Ending June 30)	Population	Deaths from Cancer	Rate per 100,000 Population
1880	30,999	12	38.7
1881	32,343	14	43.3
1882	33,687	10	29.7
1883	35,031	17	48.5
1884	36,376	10	27.5
1885	37,721	19	50.4
1881-1885	175,158	70	40.0
1886	38,906	17	43.7
1887	40,091	22	54.9
1888	41,276	20	48.5
1889	42,462	28	65.9
1890	43,648	19	43.5
1886-1890	206,383	106	51.4
1891	45,735	20	43.7
1892	47,822	22	46.0
1893	49,909	29	58.1
1894	51,996	22	42.3
1895	54,083	23	42.5
1891-1895	249,545	116	46.5
1896	55,139	25	45.3
1897	56,195	45	80.1
1898	57,251	28	48.9
1899	58,307	27	46.3
1900	59,364	30	50.5
1896-1900	286,256	155	54.1
(Calendar) 1901	60,584	32	52.8
1902	61,805	39	63.1
1903	63,026	32	50.8
1904	64,247	55	85.6
1905	65,468	54	82.5
1901-1905	315,130	212	67.3
1906	66,439	70	105.4
1907	67,410	52	77.1
1908	68,381	44	64.3
1909	69,352	54	77.9
1910	70,324	56	79.6
1906-1910	341,906	276	80.7
1911	71,296	58	81.4
1912	72,268	58	80.3
1913	73,240	48	65.5

Source: Annual Reports of the Board of Health of the State of New Jersey.

Table 70
Mortality from Cancer in Hoboken, N. J., by Sex
1902-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
MALES			
1902	31,300	22	70.3
1903	31,946	8	25.0
1904	32,592	18	55.2
1905	33,238	21	63.2
1902-1905	129,076	69	53.5
1906	33,925	27	79.6
1907	34,612	30	86.7
1908	35,300	16	45.3
1909	35,988	27	75.0
1910	36,675	19	51.8
1906-1910	176,500	119	67.4
1911	37,363	20	53.5
1912	38,051	21	55.2
1913	38,739	21	54.2
FEMALES			
1902	30,505	17	55.7
1903	31,080	24	77.2
1904	31,655	37	116.9
1905	32,230	33	102.4
1902-1905	125,470	111	88.5
1906	32,514	43	132.3
1907	32,798	22	67.1
1908	33,081	28	84.6
1909	33,364	27	80.9
1910	33,649	37	110.0
1906-1910	165,406	157	94.9
1911	33,933	38	112.0
1912	34,217	37	108.1
1913	34,501	27	78.3

Source: Annual Reports of the Board of Health of the State of New Jersey.

APPENDIX F (PART II)

Table 71
Mortality from Cancer in Indianapolis, Ind.
1900-1913

	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
	169,164	108	63.8	1911	240,098	193	80.4
				1912	246,546	216	87.6
	175,612	85	48.4	1913	252,994	222	87.7
	182,060	97	53.3				
	188,508	106	56.2				
	194,956	122	62.6				
	201,405	102	50.6				
ı5	942,541	512	54.3				
	207,854	110	52.9				
	214,303	132	61.6				
	220,752	156	70.7				
	227,201	198	87.1				
	233,650	181	77.5				
0	1,103,760	777	70.4				

Source: 1913 Annual Report of Department of Public Health and Charities of Indianapolis, Ind.

Table 72
Mortality from Cancer in Indianapolis, Ind., by Sex
1906-1913

	MALES			FEMALES			
	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
	103,049	33	32.0	1906	104,805	77	73.5
	106,304	41	38.6	1907	107,999	91	84.3
	109,559	49	44.7	1908	111,193	107	96.2
	112,814	62	55.0	1909	114,387	136	118.9
	116,069	50	43.1	1910	117,581	131	111.4
0	547,795	235	42.9	1906-1910	555,965	542	97.5
	119,323	76	63.7	1911	120,775	117	96.9
	122,577	67	54.7	1912	123,969	149	120.2
	125,831	72	57.2	1913	127,163	150	118.0

Source: Annual Reports of Department of Public Health and Charities of Indianapolis, Ind.

APPENDIX F (PART II)

Table 73
Mortality from Cancer in Jersey City, N. J.
1879-1913

Year (Ending June 30)	Population	Deaths from Cancer	Rate per 100,000 Population
1879	118,423	39	32.9
1880	120,722	35	29.0
1881	127,280	56	44.0
1882	133,838	37	27.6
1883	140,396	48	34.2
1884	146,954	61	41.5
1885	153,513	52	33.9
1881-1885	701,981	254	36.2
1886	155,411	67	43.1
1887	157,309	59	37.5
1888	159,207	69	43.3
1889	161,105	60	37.2
1890	163,003	80	49.1
1886-1890	796,035	335	42.1
1891	166,945	82	49.1
1892	170,887	92	53.8
1893	174,829	68	38.9
1894	178,771	77	43.1
1895	182,713	67	36.7
1891-1895	874,145	386	44.2
1896	187,457	94	50.1
1897	192,201	77	40.1
1898	196,945	89	45.2
1899	201,689	89	44.1
1900	206,433	85	41.2
1896-1900	984,725	434	44.1
(Calendar)			
1901	211,686	105	49.6
1902	216,939	104	47.9
1903	222,192	126	56.7
1904	227,445	114	50.1
1905	232,699	142	61.0
1901-1905	1,110,961	591	53.2

Year	Population	Deaths from Cancer	Ra 10 Pop
1906	239,715	138	
1907	246,731	159	
1908	253,747	141	
1909	260,763	153	
1910	267,779	176	
1906-1910	1,268,735	767	[illegible]
1911	274,795	181	[illegible]
1912	281,811	187	[illegible]
1913	288,827	195	[illegible]

Source: Annual Reports of the Boa
Health of the State of New Jersey.
1913 Reports of Vital Statistics—Boa
Health—Hudson County; N. J.

APPENDIX F (PART II)

Table 74
Mortality from Cancer in Jersey City, N. J., by Sex
1902-1913

	MALES			FEMALES			
	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
	109,004	41	37.6	1902	107,935	63	58.4
	111,493	43	38.6	1903	110,699	83	75.0
	113,982	44	38.6	1904	113,463	70	61.7
	116,471	44	37.8	1905	116,228	98	84.3
5	450,950	172	38.1	1902-1905	448,325	314	70.0
	120,668	49	40.6	1906	119,047	89	74.8
	124,865	63	50.5	1907	121,866	96	78.8
	129,062	60	46.5	1908	124,685	81	65.0
	133,259	56	42.0	1909	127,504	97	76.1
	137,457	55	40.0	1910	130,322	121	92.8
0	645,311	283	43.9	1906-1910	623,424	484	77.6
	141,655	78	55.1	1911	133,140	103	77.4
	145,853	66	45.3	1912	135,958	121	89.0
	150,051	71	47.3	1913	138,768	124	89.4

Source: Annual Reports of the Board of Health of the State of New Jersey.

Table 75
Mortality from Cancer in Kansas City, Mo.
1900-1913

	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
	163,752	65	39.7	1906	214,529	148	69.0
				1907	222,992	153	68.6
	172,214	78	45.3	1908	231,455	141	60.9
	180,677	101	55.9	1909	239,918	179	74.6
	189,140	96	50.8	1910	248,381	202	81.3
	197,603	128	64.8				
	206,066	110	53.4	1906-1910	1,157,275	823	71.1
'5	945,700	513	54.2	1911	256,843	236	91.9
				1912	265,306	223	84.1
				1913	273,768	237	86.6

Source: United States Mortality Statistics.

APPENDIX F (PART II)

Table 76
Mortality from Cancer in Los Angeles, Cal.
1900-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	102,479	92	89.8
1901	124,150	111	89.4
1902	145,822	119	81.6
1903	167,494	146	87.2
1904	189,166	117	61.9
1905	210,838	175	83.0
1901-1905	837,470	668	79.8
1906	232,510	217	93.3
1907	254,182	223	87.7
1908	275,854	245	88.8
1909	297,526	286	96.1
1910	319,198	338	105.9
1906-1910	1,379,270	1,309	94.9
1911	340,869	328	96.2
1912	362,541	413	113.9
1913	384,212	425	110.6

Source: United States Mortality Statistics.

Table 77
Mortality from Cancer in Louisville, Ky.
1890-1913

Year (Ending August 31)	Population	Deaths from Cancer	Rate per 100,000 Population
1890	161,129	82	50.9
1891	165,489	84	50.8
1892	169,849	85	50.0
1893	174,209	93	53.4
1894	178,569	99	55.4
1895	182,929	95	51.9
1891-1895	871,045	456	52.4
1896	187,289	92	49.1
1897	191,649	84	43.8
1898	196,009	124	63.3
1899	200,370	105	52.4
1900	204,731	121	59.1
1896-1900	980,048	526	53.7
1901	206,650	109	52.7
1902	208,569	127	60.9
1903	210,488	114	54.2
1904	212,408	125	58.8
1905	214,328	127	59.3
1901-1905	1,052,443	602	57.2
1906	216,248	129	59.7
1907	218,168	110	50.4
1908	220,088	155	70.4
1909	222,008	126	56.8
1910	223,928	153	68.3
1906-1910	1,100,440	673	61.1
1911	225,847	163	72.2
1912	227,766	152	66.7
1913	229,685	165	71.8

Source: Annual Reports of the Health Officer of the City of Louisville, Ky.

APPENDIX F (PART II)

Table 78
Mortality from Cancer in Memphis, Tenn.
1891-1914

	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
	68,277	16	23.4	1901	105,198	36	34.2
	72,059	21	29.1	1902	108,076	38	35.2
	75,841	12	15.8	1903	110,954	51	46.0
	79,623	15	18.8	1904	113,832	35	30.7
	83,405	19	22.8	1905	116,710	43	36.8
95	379,205	83	21.9	1901-1905	554,770	203	36.6
	87,188	16	18.4	1906	119,589	55	46.0
	90,971	21	23.1	1907	122,468	57	46.5
	94,754	29	30.6	1908	125,347	67	53.5
	..	..	..	1909	128,226	53	41.3
	102,320	47	45.9	1910	131,105	73	55.7
0	375,233	113	30.1	1906-1910	626,735	305	48.7
				1911	133,983	64	47.8
				1912	136,861	76	55.5
				1913	139,739	61	43.7
				1914	142,617	110	77.1

Source: Annual Reports of the Board of Health of the City of Memphis, Tenn.

Table 79
Mortality from Cancer in Memphis, Tenn., White
1891-1914

	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
	37,427	7	18.7	1901	55,001	16	29.1
	39,088	14	35.8	1902	57,622	22	38.2
	40,749	9	22.1	1903	60,243	41	68.1
	42,410	10	23.6	1904	62,864	29	46.1
	44,071	13	29.5	1905	65,485	30	45.8
5	203,745	53	26.0	1901-1905	301,215	138	45.8
	45,732	9	19.7	1906	68,106	43	63.1
	47,394	17	35.9	1907	70,727	38	53.7
	49,056	23	46.9	1908	73,348	47	64.1
	..	..	..	1909	75,969	38	50.0
	52,380	32	61.1	1910	78,590	51	64.9
0	194,562	81	41.6	1906-1910	366,740	217	59.2
				1911	81,211	40	49.3
				1912	83,832	45	53.7
				1913	86,453	35	40.5
				1914	89,074	85	95.4

Source: Annual Reports of the Board of Health of the City of Memphis, Tenn.

APPENDIX F (PART II)

Table 80
Mortality from Cancer in Memphis, Tenn., Colored
1891-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	30,850	9	29.2
1892	32,971	7	21.2
1893	35,092	3	8.5
1894	37,213	5	13.4
1895	39,334	6	15.3
1891-1895	175,460	30	17.1
1896	41,456	7	16.9
1897	43,577	4	9.2
1898	45,698	6	13.1
1899	..	..	..
1900	49,940	15	30.0
1896-1900	180,671	32	17.7

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	50,197	20	39.8
1902	50,454	16	31.7
1903	50,711	10	19.7
1904	50,968	6	11.8
1905	51,225	13	25.4
1901-1905	253,555	65	25.6
1906	51,483	12	23.3
1907	51,741	19	36.7
1908	51,999	20	38.5
1909	52,257	15	28.7
1910	52,515	22	41.9
1906-1910	259,995	88	33.8
1911	52,772	24	45.5
1912	53,029	31	58.5
1913	53,286	26	48.8
1914	53,543	25	46.7

Source: Annual Reports of the Board of Health of the City of Memphis, Tenn.

Table 81
Mortality from Cancer in Milwaukee, Wis.
1894-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1894	240,325	107	44.5
1895	249,290	149	59.8
1896	256,495	160	62.4
1897	263,700	164	62.2
1898	270,905	166	61.3
1899	278,110	194	69.8
1900	285,315	196	68.7
1896-1900	1,354,525	880	65.0
1901	290,841	206	70.8
1902	296,367	208	70.2
1903	301,894	212	70.2
1904	307,421	224	72.9
1905	312,948	206	65.8
1901-1905	1,509,471	1,056	70.0

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	325,129	234	72.0
1907	337,311	230	68.2
1908	349,493	218	62.4
1909	361,675	259	71.6
1910	373,857	254	67.9
1906-1910	1,747,465	1,195	68.4
1911	386,038	278	72.0
1912	398,219	283	71.1
1913	410,400	287	69.9

Source: Annual Reports of the Commissioner of Health of the City of Milwaukee, Wis.

APPENDIX F (PART II)

Table 82
Mortality from Cancer in Milwaukee, Wis., Males
1898-1913

	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
	133,460	74	55.4	1906	162,939	106	65.1
	136,998	95	69.3	1907	169,576	93	54.8
	140,536	72	51.2	1908	176,213	99	56.2
				1909	182,850	107	58.5
00	410,994	241	58.6	1910	189,488	120	63.3
	143,689	92	64.0	1906-1910	881,066	525	59.6
	146,842	87	59.2				
	149,995	91	60.7	1911	196,125	124	63.2
	153,148	103	67.3	1912	202,762	118	58.2
	156,302	95	60.8	1913	209,399	120	57.3
05	749,976	468	62.4				

Source: Annual Reports of the Commissioner of Health of the City of Milwaukee, Wis.

Table 83
Mortality from Cancer in Milwaukee, Wis., Females
1898-1913

	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
	137,445	92	66.9	1906	162,190	128	78.9
	141,112	99	70.2	1907	167,735	137	81.7
	144,779	124	85.6	1908	173,280	119	68.7
				1909	178,825	152	85.0
00	423,336	315	74.4	1910	184,369	134	72.7
	147,152	114	77.5	1906-1910	866,399	670	77.3
	149,525	121	80.9				
	151,899	121	79.7	1911	189,913	154	81.1
	154,273	121	78.4	1912	195,457	165	84.4
	156,646	111	70.9	1913	201,001	167	83.1
05	759,495	588	77.4				

Source: Annual Reports of the Commissioner of Health of the City of Milwaukee, Wis.

APPENDIX F (PART II)

Table 84
Mortality from Cancer in Minneapolis, Minn.
1889-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1889	152,952	76	49.7
1890	164,738	68	41.3
1891	168,536	61	36.2
1892	172,334	79	45.8
1893	176,132	84	47.7
1894	179,930	91	50.6
1895	183,728	82	44.6
1891-1895	880,660	397	45.1
1896	187,526	103	54.9
1897	191,324	91	47.6
1898	195,122	106	54.3
1899	198,920	95	47.8
1900	202,718	120	59.2
1896-1900	975,610	515	52.8
1901	212,587	133	62.6
1902	222,456	117	52.6
1903	232,325	154	66.3
1904	242,194	140	57.8
1905	252,063	162	64.3
1901-1905	1,161,625	706	60.8
1906	261,932	171	65.3
1907	271,801	189	69.5
1908	281,670	179	63.5
1909	291,539	186	63.8
1910	301,408	195	64.7
1906-1910	1,408,350	920	65.3
1911	311,277	234	75.2
1912	321,146	258	80.3
1913	331,015	276	83.4

Source: Annual Reports of the Department of Health of the City of Minneapolis, Minn.

Table 85
Mortality from Cancer in Minneapolis, Minn., by Organs and Parts according to Sex, 1908-1912

Organ or Part	TOTAL Deaths from Cancer	TOTAL Rate per 100,000 Population	MALES Deaths from Cancer	MALES Rate per 100,000 Population	FEMALES Deaths from Cancer	FEMALES Rate per 100,000 Population
Buccal cavity	40	2.7	34	4.3	6	0.8
Stomach and liver	421	27.9	244	31.0	177	24.6
Peritoneum, intestines, rectum	121	8.0	58	7.4	63	8.7
Female generative organs	144	9.6	..	..	144	20.0
Breast	102	6.8	1	0.1	101	14.0
Skin	32	2.1	20	2.5	12	1.7
Other or not specified organs	192	12.7	116	14.8	76	10.6
All organs	1,052	69.8	473	60.1	579	80.4

Source: Annual Reports of the Department of Health of the City of Minneapolis, Minn.

Table 86

[M]ortality from Cancer in Minneapolis, Minn., by Organs and Parts according to Age, 1908-1912

Organ or Part	Under 40 Deaths from Cancer	Under 40 Rate per 100,000 Population	40-59 Deaths from Cancer	40-59 Rate per 100,000 Population	60 and Over Deaths from Cancer	60 and Over Rate per 100,000 Population
[...]l cavity...............	2	0.2	16	5.4	22	25.3
[...]ch and liver...........	27	2.4	189	64.2	205	235.4
[...]neum, intestines, rectum	17	1.5	40	13.6	64	73.5
[...]e generative organs.....	16	1.4	88	29.9	40	45.9
....	10	0.9	56	19.0	36	41.3
....	5	0.5	5	1.7	22	25.3
[...]or not specified organs..	36	3.2	78	26.5	78	89.4
[...]ans..................	113	10.1	472	160.3	467	536.1

[So]urce: Annual Reports of the Department of Health of the City of Minneapolis,

Table 87

Mortality from Cancer in Nashville, Tenn. 1879-1914

[Yea]r [...]o)	Population	Deaths from Cancer	Rate per 100,000 Population
9	41,601	6	14.4
0	43,350	9	20.8
1	46,631	9	19.3
2	49,912	15	30.1
3	53,194	8	15.0
4	56,476	16	28.3
5	59,758	12	20.1
1885	265,971	60	22.6
6	63,040	11	17.4
7	66,322	9	13.6
8	69,604	14	20.1
9	72,886	14	19.2
0	76,168	19	24.9
1890	348,020	67	19.3
[Calen]dar)			
1	76,637	23	30.0
2	77,106	23	29.8
3	77,575	28	36.1
4	78,045	27	34.6
5	78,515	38	48.4
1895	387,878	139	35.8

Year (Calendar)	Population	Deaths from Cancer	Rate per 100,000 Population
1896	78,985	42	53.2
1897	79,455	29	36.5
1898	79,925	40	50.0
1899	80,395	53	65.9
1900	80,865	27	33.4
1896-1900	399,625	191	47.8
1901	83,814	49	58.5
1902	86,764	36	41.5
1903	89,714	44	49.0
1904	92,664	51	55.0
1905	95,614	55	57.5
1901-1905	448,570	235	52.4
1906	98,564	61	61.9
1907	101,514	74	72.9
1908	104,464	78	74.7
1909	107,414	69	64.2
1910	110,364	73	66.1
1906-1910	522,320	355	68.0
1911	113,314	81	71.5
1912	116,264	76	65.4
1913	119,214	86	72.1
1914	122,165	94	76.9

Source: Annual Reports of the Health Officer of the City of Nashville, Tenn.

Table 88

Mortality from Cancer in Nashville, Tenn., Males, 1885-1913

Year (Ending Sept. 30)	Population	Deaths from Cancer	Rate per 100,000 Population
1885	29,171	3	10.3
1886	30,716	3	9.8
1887	..	..	..
1888	33,786	2	5.9
1889	35,312	2	5.7
1890	36,832	7	19.0
1886-1890	136,646	14	10.2
(Calendar)			
1891	36,984	6	16.2
1892	37,136	5	13.5
1893	37,288	8	21.5
1894	37,440	6	16.0
1895	37,592	8	21.3
1891-1895	186,440	33	17.7
1896	37,744	8	21.2
1897	37,897	7	18.5
1898	38,050	8	21.0
1899	38,203	11	28.8
1900	38,356	9	23.5
1896-1900	190,250	43	22.6
1901	39,735	15	37.8
1902	41,115	11	26.8
1903	42,495	12	28.2
1904	43,875	19	43.3
1905	45,255	18	39.8
1901-1905	212,475	75	35.3
1906	46,635	14	30.0
1907	48,015	27	56.2
1908	49,395	20	40.5
1909	50,775	13	25.6
1910	52,155	20	38.3
1906-1910	246,975	94	38.1
1911	53,535	25	46.7
1912	54,915	14	25.5
1913	56,295	30	53.3

Source: Annual Reports of the Health Officer of the City of Nashville, Tenn.

Table 89

Mortality from Cancer in Nashville, Tenn., Females, 1885-1913

Year (Ending Sept. 30)	Population	Deaths from Cancer	Rate per 100,000 Population
1885	30,587	9	29.4
1886	32,324	8	24.7
1887	..	..	..
1888	35,818	12	33.5
1889	37,574	12	31.9
1890	39,336	12	30.5
1886-1890	145,052	44	30.3
(Calendar)			
1891	39,653	17	42.9
1892	39,970	18	45.0
1893	40,287	20	49.6
1894	40,605	21	51.7
1895	40,923	30	73.3
1891-1895	201,438	106	52.6
1896	41,241	34	82.4
1897	41,558	22	52.9
1898	41,875	32	76.4
1899	42,192	42	99.5
1900	42,509	18	42.3
1896-1900	209,375	148	70.7
1901	44,079	34	77.1
1902	45,649	25	54.8
1903	47,219	32	67.8
1904	48,789	32	65.6
1905	50,359	37	73.5
1901-1905	236,095	160	67.8
1906	51,929	47	90.5
1907	53,499	47	87.9
1908	55,069	58	105.3
1909	56,639	56	98.9
1910	58,209	53	91.1
1906-1910	275,345	261	94.8
1911	59,779	56	93.7
1912	61,349	62	101.1
1913	62,919	56	89.0

Source: Annual Reports of the Health Officer of the City of Nashville, Tenn.

APPENDIX F (PART II)

Table 90
Mortality from Cancer in Nashville, Tenn., White
1885-1914

Year (Ending Sept. 30)	Population	Deaths from Cancer	Rate per 100,000 Population
1885	36,888	6	16.3
1886	38,865	8	20.6
1887	..	..	..
1888	42,819	10	23.4
1889	44,796	9	20.1
1890	46,773	13	27.8
1886-1890	173,253	40	23.1
(Calendar)			
1891	47,175	20	42.4
1892	47,577	20	42.0
1893	47,979	19	39.6
1894	48,381	14	28.9
1895	48,783	25	51.2
1891-1895	239,895	98	40.9
1896	49,185	29	59.0
1897	49,587	17	34.3
1898	49,990	26	52.0
1899	50,393	28	55.6
1900	50,796	17	33.5
1896-1900	249,951	117	46.8
1901	53,099	33	62.1
1902	55,402	21	37.9
1903	57,705	27	46.8
1904	60,008	39	65.0
1905	62,311	46	73.8
1901-1905	288,525	166	57.5
1906	64,615	38	58.8
1907	66,919	57	85.2
1908	69,223	56	80.9
1909	71,527	49	68.5
1910	73,831	58	78.6
1906-1910	346,115	258	74.5
1911	76,135	65	85.4
1912	78,438	56	71.4
1913	80,742	73	90.4
1914	83,047	66	79.5

Source: Annual Reports of the Health Officer of the City of Nashville, Tenn.

Table 91

Mortality from Cancer in Nashville, Tenn., Colored 1885-1914

Year (Ending Sept. 30)	Population	Deaths from Cancer	Rate per 100,000 Population	Year (Calendar)	Population	Deaths from Cancer	Rate per 100,000 Population
1885	22,870	6	26.2	1901	30,715	16	52.1
				1902	31,362	15	47.8
1886	24,175	3	12.4	1903	32,009	17	53.1
1887	..	..	..	1904	32,656	12	36.7
1888	26,785	4	14.9	1905	33,303	9	27.0
1889	28,090	5	17.8				
1890	29,395	6	20.4	1901-1905	160,045	69	43.1
1886-1890	108,445	18	16.6	1906	33,949	23	67.7
(Calendar)				1907	34,595	17	49.1
1891	29,462	3	10.2	1908	35,241	22	62.4
1892	29,529	3	10.2	1909	35,887	20	55.7
1893	29,596	9	30.4	1910	36,533	15	41.1
1894	29,664	13	43.8				
1895	29,732	13	43.7	1906-1910	176,205	97	55.0
1891-1895	147,983	41	27.7	1911	37,179	16	43.0
				1912	37,826	20	52.9
1896	29,800	13	43.6	1913	38,472	13	33.8
1897	29,868	12	40.2	1914	39,118	28	71.6
1898	29,935	14	46.8				
1899	30,002	25	83.3				
1900	30,069	10	33.3				
1896-1900	149,674	74	49.4				

Source: Annual Reports of the Health Officer of the City of Nashville, Tenn.

Table 92

Mortality from Cancer in Nashville, Tenn., by Organs and Parts according to Sex, 1903-1912

Organ or Part	TOTAL Deaths from Cancer	TOTAL Rate per 100,000 Population	MALES Deaths from Cancer	MALES Rate per 100,000 Population	FEMALES Deaths from Cancer	FEMALES Rate per 100,000 Population
Buccal cavity	29	2.8	20	4.1	9	1.7
Stomach and liver	180	17.5	67	13.8	113	20.8
Peritoneum, intestines, rectum	71	6.9	24	4.9	47	8.7
Female generative organs	184	17.9	..	..	184	33.9
Breast	74	7.2	..	..	74	13.6
Skin	19	1.8	10	2.1	9	1.7
Other or not specified organs	105	10.2	61	12.5	44	8.0
All organs	662	64.3	182	37.4	480	88.4

Source: Annual Reports of the Health Officer of the City of Nashville, Tenn.

APPENDIX F (PART II)

Table 93

Mortality from Cancer in Newark, N. J.

1859-1913

	Population	Deaths from Cancer	Rate per 100,000 Population
	67,895	17	25.0
	71,941	9	12.5
	75,035	11	14.7
	..	..	..
	81,223	12	14.8
	84,318	11	13.0
	..	..	..
365	380,412	60	15.8
	90,942	15	16.5
	94,471	21	22.2
	..	..	..
	101,529	22	21.7
	105,059	20	19.0
370	392,001	78	19.9
	108,709	23	21.2
	112,359	31	27.6
	116,009	42	36.2
	119,659	46	38.4
	123,310	25	20.3
375	580,046	167	28.8
	125,949	48	38.1
	128,588	50	38.9
	131,228	70	53.3
	133,868	57	42.6
	136,508	62	45.4
380	656,141	287	43.7
	139,804	61	43.6
	143,100	58	40.5
	146,396	60	41.0
	149,692	82	54.8
	152,988	80	52.3
385	731,980	341	46.6
	158,756	91	57.3
	164,524	91	55.3
	170,292	94	55.2
	176,061	91	51.7
	181,830	85	46.7
390	851,463	452	53.1

Year (Calendar)	Population	Deaths from Cancer	Rate per 100,000 Population
1891	188,625	98	52.0
1892	195,420	117	59.9
1893	202,215	101	49.9
1894	209,010	134	64.1
1895	215,806	126	58.4
1891-1895	1,011,076	576	57.0
1896	221,858	140	63.1
1897	227,911	122	53.5
1898	233,964	130	55.6
1899	240,017	135	56.2
1900	246,070	159	64.6
1896-1900	1,169,820	686	58.6
1901	253,513	171	67.5
1902	260,957	150	57.5
1903	268,401	178	66.3
1904	275,845	174	63.1
1905	283,289	189	66.7
1901-1905	1,342,005	862	64.2
1906	296,125	209	70.6
1907	308,961	249	80.6
1908	321,797	229	71.2
1909	334,633	264	78.9
1910	347,469	286	82.3
1906-1910	1,608,985	1,237	76.9
1911	360,305	275	76.3
1912	373,141	299	80.1
1913	385,977	303	78.5

Source: Annual Reports of the Board of Health of the State of New Jersey.

Table 94

Mortality from Cancer in Newark, N. J., by Sex 1902-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
MALES			
1902	128,647	43	33.4
1903	132,458	67	50.6
1904	136,269	63	46.2
1905	140,080	68	48.5
1902-1905	537,454	241	44.8
1906	146,741	64	43.6
1907	153,403	92	60.0
1908	160,065	83	51.9
1909	166,727	100	60.0
1910	173,389	98	56.5
1906-1910	800,325	437	54.6
1911	180,051	98	54.4
1912	186,713	114	61.1
1913	193,375	129	66.7
FEMALES			
1902	132,310	107	80.9
1903	135,943	111	81.7
1904	139,576	111	79.5
1905	143,209	121	84.5
1902-1905	551,038	450	81.7
1906	149,384	145	97.1
1907	155,558	157	100.9
1908	161,732	146	90.3
1909	167,906	164	97.7
1910	174,080	188	108.0
1906-1910	808,660	800	98.9
1911	180,254	177	98.2
1912	186,428	185	99.2
1913	192,602	174	90.3

Source: Annual Reports of the Board of Health of the State of New Jersey.

Table 95

Mortality from Cancer in New Haven, Conn. 1880-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1880	62,882	37	58.8
1881	64,723	43	66.4
1882	66,564	31	46.6
1883	68,405	40	58.5
1884	70,246	40	56.9
1885	72,088	30	41.6
1881-1885	342,026	184	53.8
1886	73,930	48	64.9
1887	75,772	48	63.3
1888	77,614	40	51.5
1889	79,456	39	49.1
1890	81,298	39	48.0
1886-1890	388,070	214	55.1
1891	83,970	35	41.7
1892	86,643	53	61.2
1893	89,316	47	52.6
1894	91,989	54	58.7
1895	94,662	60	63.4
1891-1895	446,580	249	55.8
1896	97,335	60	61.6
1897	100,008	64	64.0
1898	102,681	71	69.1
1899	105,354	74	70.2
1900	108,027	71	65.7
1896-1900	513,405	340	66.2
1901	110,584	98	88.6
1902	113,141	87	76.9
1903	115,699	90	77.8
1904	118,257	81	68.5
1905	120,815	110	91.0
1901-1905	578,496	466	80.6
1906	123,373	98	79.4
1907	125,931	109	86.6
1908	128,489	129	100.4
1909	131,047	119	90.8
1910	133,605	122	91.3
1906-1910	642,445	577	89.8
1911	136,163	112	82.3
1912	138,721	134	96.6
1913	141,279	127	89.9

Source: Annual Reports of the Board of Health of the City of New Haven, Conn.

APPENDIX F (PART II)

Table 96
Mortality from Cancer in New Haven, Conn., Males
1880-1913

	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
	31,213	8	25.6	1906	61,552	35	56.9
				1907	62,837	44	70.0
	32,135	14	43.6	1908	64,123	61	95.1
	33,057	10	30.3	1909	65,409	49	74.9
	33,979	10	29.4	1910	66,695	49	73.5
	34,901	11	31.5				
	35,823	14	39.1	1906-1910	320,616	238	74.2
85	169,895	59	34.7	1911	67,981	37	54.4
				1912	69,267	62	89.5
	36,745	16	43.5	1913	70,553	47	66.6
	37,668	15	39.8				
	38,591	13	33.7				
	39,514	11	27.8				
	40,437	11	27.2				
90	192,955	66	34.2				
	41,777	11	26.3				
	43,117	17	39.4				
	44,457	18	40.5				
	45,797	22	48.0				
	47,137	16	33.9				
95	222,285	84	37.8				
	48,478	23	47.4				
	49,819	22	44.2				
	51,160	23	45.0				
	52,501	23	43.8				
	53,842	32	59.4				
00	255,800	123	48.1				
	55,127	37	67.1				
	56,412	27	47.9				
	57,697	29	50.3				
	58,982	24	40.7				
	60,267	46	76.3				
05	288,485	163	56.5				

Source: Annual Reports of the Board of Health of the City of New Haven, Conn.

APPENDIX F (PART II)

Table 97
Mortality from Cancer in New Haven, Conn., Females
1880-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1880	31,669	29	91.6
1881	32,588	29	89.0
1882	33,507	21	62.7
1883	34,426	30	87.1
1884	35,345	29	82.0
1885	36,265	16	44.1
1881-1885	172,131	125	72.6
1886	37,185	32	86.1
1887	38,104	33	86.6
1888	39,023	27	69.2
1889	39,942	28	70.1
1890	40,861	28	68.5
1886-1890	195,115	148	75.9
1891	42,193	24	56.9
1892	43,526	36	82.7
1893	44,859	29	64.6
1894	46,192	32	69.3
1895	47,525	44	92.6
1891-1895	224,295	165	73.6
1896	48,857	37	75.7
1897	50,189	42	83.7
1898	51,521	48	93.2
1899	52,853	51	96.5
1900	54,185	39	72.0
1896-1900	257,605	217	84.2
1901	55,457	61	110.0
1902	56,729	60	105.8
1903	58,002	61	105.2
1904	59,275	57	96.2
1905	60,548	64	105.6
1901-1905	290,011	303	104.5

Year	Population	Deaths from Cancer	R 10 Pop
1906	61,821	63	[illegible]
1907	63,094	65	[illegible]
1908	64,366	68	[illegible]
1909	65,638	70	[illegible]
1910	66,910	73	[illegible]
1906-1910	321,829	339	[illegible]
1911	68,182	75	[illegible]
1912	69,454	72	[illegible]
1913	70,726	80	[illegible]

Source: Annual Reports of the Bo Health of the City of New Haven, Cc

APPENDIX F (PART II)

Table 98
Mortality from Cancer in New Orleans, La.
1871-1914

	Population	Deaths from Cancer	Rate per 100,000 Population
	193,753	90	46.5
	196,117	90	45.9
	198,509	94	47.4
	200,931	87	43.3
	203,382	89	43.8
5	992,692	450	45.3
	205,863	91	44.2
	208,375	114	54.7
	210,917	115	54.5
	214,490	105	49.0
	216,090	129	59.7
0	1,055,735	554	52.5
	218,571	127	58.1
	221,045	143	64.7
	223,565	122	54.6
	226,114	151	66.8
	228,692	138	60.3
5	1,117,987	681	60.9
	231,299	158	68.3
	233,936	147	62.8
	236,603	143	60.4
	239,300	132	55.2
	242,039	190	78.5
0	1,183,177	770	65.1
	246,545	158	64.1
	251,051	168	66.9
	255,557	172	67.3
	260,063	174	66.9
	264,569	188	71.1
5	1,277,785	860	67.3
	269,076	139	51.7
	273,583	183	66.9
	278,090	185	66.5
	282,597	171	60.5
	287,104	185	64.4
0	1,390,450	863	62.1

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	292,301	206	70.5
1902	297,498	214	71.9
1903	302,695	235	77.6
1904	307,892	252	81.8
1905	313,089	261	83.4
1901-1905	1,513,475	1,168	77.2
1906	318,286	247	77.6
1907	323,483	269	83.2
1908	328,680	270	82.1
1909	333,877	280	83.9
1910	339,075	285	84.1
1906-1910	1,643,401	1,351	82.2
1911	344,273	277	80.5
1912	349,471	328	93.9
1913	354,669	330	93.0
1914	359,867	349	97.0

Source: 1871-1899, Vital Statistics of New Orleans, La., Annual Reports of the Board of Health of New Orleans, La.

APPENDIX F (PART II)

Table 99

Mortality from Cancer in New Orleans, La., White 1877-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1877	153,132	87	56.8
1878	154,877	89	57.5
1879	156,622	75	47.9
1880	158,367	102	64.4
1877-1880	622,998	353	56.7
1881	160,267	88	54.9
1882	162,168	113	69.7
1883	..	..	..
1884	165,970	113	68.1
1885	167,871	102	60.8
1881-1885	656,276	416	63.4
1886	169,772	110	64.8
1887	171,673	104	60.6
1888	173,574	109	62.8
1889	175,475	111	63.3
1890	177,376	142	80.1
1886-1890	867,870	576	66.4
1891	180,533	118	65.4
1892	183,690	123	67.0
1893	186,847	128	68.5
1894	190,004	132	69.5
1895	193,161	134	69.4
1891-1895	934,235	635	68.0
1896	196,318	110	56.0
1897	199,475	145	72.7
1898	202,632	140	69.1
1899	205,789	131	63.7
1900	208,946	139	66.5
1896-1900	1,013,160	665	65.6
1901	212,991	146	68.5
1902	217,036	166	76.5
1903	221,081	174	78.7
1904	225,127	186	82.6
1905	229,173	196	85.5
1901-1905	1,105,408	868	78.5
1906	233,219	183	78.5
1907	237,265	201	84.7
1908	241,311	210	87.0
1909	245,357	223	90.9
1910	249,403	216	86.6
1906-1910	1,206,555	1,033	85.6
1911	253,449	208	82.1
1912	257,495	242	94.0
1913	261,541	242	92.5
1914	265,587	257	96.8

Source: 1877-1899, Vital Statistics of New Orleans, La., Annual Reports of the Board of Health of New Orleans, La.

APPENDIX F (PART II)

Table 100

Mortality from Cancer in New Orleans, La., Colored 1877-1914

r	Population	Deaths from Cancer	Rate per 100,000 Population
7	55,243	27	48.9
8	56,040	26	46.4
9	57,868	30	51.8
0	57,723	27	46.8
.880	226,874	110	48.5
1	58,304	39	66.9
2	58,877	30	51.0
3	..	..	..
4	60,144	38	63.2
5	60,821	36	59.2
1885	238,146	143	60.0
6	61,527	48	78.0
7	62,263	43	69.1
8	63,029	34	53.9
9	63,825	21	32.9
0	64,663	48	74.2
1890	315,307	194	61.5
1	66,012	40	60.6
2	67,361	45	66.8
3	68,710	44	64.0
4	70,059	42	59.9
5	71,408	54	75.6
1895	343,550	225	65.5
6	72,758	29	39.9
7	74,108	38	51.3
8	75,458	45	59.6
9	76,808	40	52.1
0	78,158	46	58.9
1900	377,290	198	52.5

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	79,310	60	75.7
1902	80,462	48	59.7
1903	81,614	61	74.7
1904	82,765	66	79.7
1905	83,916	65	77.5
1901-1905	408,067	300	73.5
1906	85,067	64	75.2
1907	86,218	68	78.9
1908	87,369	60	68.7
1909	88,520	57	64.4
1910	89,672	69	76.9
1906-1910	436,846	318	72.8
1911	90,824	69	76.0
1912	91,976	86	93.5
1913	93,128	88	94.5
1914	94,280	92	97.6

Source: 1877-1899, Vital Statistics of New Orleans, La., Annual Reports of the Board of Health of New Orleans, La.

APPENDIX F (PART II)

Table 101
Mortality from Cancer in New Orleans, La., by Sex
1901-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
	MALES		
1901	138,785	89	64.1
1902	141,502	72	50.9
1903	144,219	79	54.8
1904	146,936	90	61.3
1905	149,653	93	62.1
1901-1905	721,095	423	58.7
1906	152,370	105	68.9
1907	155,087	100	64.5
1908	157,804	97	61.5
1909	160,521	114	71.0
1910	163,239	110	67.4
1906-1910	789,021	526	66.7
1911	165,957	101	60.9
1912	168,675	158	93.7
1913	171,393	139	81.1
	FEMALES		
1901	153,516	117	76.2
1902	155,996	142	91.0
1903	158,476	156	98.4
1904	160,956	162	100.6
1905	163,436	168	102.8
1901-1905	792,380	745	94.0
1906	165,916	142	85.6
1907	168,396	169	100.4
1908	170,876	173	101.2
1909	173,356	166	95.8
1910	175,836	175	99.5
1906-1910	854,380	825	96.6
1911	178,316	176	98.7
1912	180,796	170	94.0
1913	183,276	191	104.2

Source: Annual Reports of the Board of Health of New Orleans, La.

Table 102

ortality from Cancer in New Orleans, La., by Organs and Parts according to Race, 1904-1913

	TOTAL		WHITE		COLORED	
Organ or Part	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population
.vity...............	144	4.3	120	4.9	24	2.7
and liver...........	802	24.2	616	25.3	186	21.1
m, intestines, rectum	214	6.5	161	6.6	53	6.0
enerative organs.....	690	20.8	444	18.2	246	28.0
....	207	6.2	149	6.1	58	6.6
....	30	0.9	26	1.1	4	0.5
not specified organs..	712	21.6	591	24.4	121	13.8
s..................	2,799	84.5	2,107	86.6	692	78.7

: Annual Reports of the Board of Health of the City of New Orleans, La.

Table 103

ortality from Cancer in New Orleans, La., by Organs and Parts according to Sex and Race, 1904-1913

	MALES					
	TOTAL		WHITE		COLORED	
Organ or Part	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population
.vity...............	111	7.0	93	7.8	18	4.4
and liver...........	427	26.8	327	27.5	100	24.7
m, intestines, rectum	100	6.3	76	6.4	24	5.9
....	21	1.3	18	1.5	3	0.7
not specified organs..	448	28.2	380	32.1	68	16.9
s..................	1,107	69.6	894	75.3	213	52.6
	FEMALES					
.vity...............	33	1.9	27	2.2	6	1.3
and liver...........	375	21.8	289	23.2	86	18.1
m, intestines, rectum	114	6.6	85	6.8	29	6.1
enerative organs.....	690	40.1	444	35.6	246	51.8
....	207	12.0	149	12.0	58	12.2
....	9	0.5	8	0.6	1	0.2
not specified organs..	264	15.4	211	16.9	53	11.2
s..................	1,692	98.3	1,213	97.3	479	100.9

e: Annual Reports of the Board of Health of the City of New Orleans, La.

Table 104
Cancer in the Charity Hospital of New Orleans, 1908-1912

WHITE PATIENTS

ORGAN OR PART	Admissions		Cured		Improved		Stationary		Died	
	Number	Rate*	Number	Per Cent. of Admitted	Number	Per Cent. of Admitted	Number	Per Cent. of Admitted	Number	Per Cent. of Admitted
Buccal cavity	113	9.1	24	21.2	14	12.4	58	51.3	17	15.1
Stomach and liver	110	8.8	..	..	19	17.3	47	42.7	44	40.0
Peritoneum, intestines and rectum	47	3.8	2	4.3	7	14.9	24	51.0	14	29.8
Female generative organs	189	15.2	21	11.1	46	24.3	93	49.2	29	15.4
Breast	56	4.5	14	25.0	14	25.0	19	33.9	9	16.1
Skin	121	9.7	26	21.5	35	28.9	43	35.5	17	14.1
Other or not specified	232	18.6	52	22.4	54	23.3	80	34.5	46	19.8
All organs and parts	868	69.6	139	16.0	189	21.8	364	41.9	176	20.3
Buccal Cavity:										
Cheek	..	..	..	..	..	..	..	..	..	..
Gum	2	0.2	..	..	..	..	2	100.0	..	..
Lip	40	3.2	15	37.5	4	10.0	17	42.5	4	10.0
Maxilla	33	2.6	4	12.1	7	21.2	14	42.4	8	24.3
Mouth	10	0.8	1	10.0	2	20.0	5	50.0	2	20.0
Palate	1	0.1	..	..	..	..	1	100.0	..	..
Submaxillary gland	2	0.2	1	50.0	..	..	1	50.0	..	..
Tongue	23	1.8	3	13.0	1	4.4	16	69.6	3	13.0
Tonsil	2	0.2	..	..	..	..	2	100.0	..	..
Stomach and Liver:										
Gall-bladder	2	0.2	..	..	1	50.0	..	..	1	50.0
Liver	28	2.2	..	..	2	7.1	14	50.0	12	42.9
Œsophagus	6	0.5	..	..	1	16.7	1	16.7	4	66.7
Pharynx	4	0.3	..	..	..	..	3	75.0	1	25.0
Stomach	70	5.6	..	..	15	21.4	29	41.5	26	37.1
Peritoneum, Intestines and Rectum:										
Abdominal viscera	2	0.2	..	..	..	..	2	100.0	..	..

WHITE PATIENTS

ORGAN OR PART	Admissions		Cured		Improved		Stationary		Died	
	Number	Rate*	Number	Per Cent. of Admitted	Number	Per Cent. of Admitted	Number	Per Cent. of Admitted	Number	Per Cent. of Admitted
Peritoneum, Intestines, Rectum (*Cont.*):										
Intestines	12	1.0	..	..	..	..	8	66.7	4	33.3
Mesentery	5	0.4	..	..	..	..	2	40.0	3	60.0
Omentum	2	0.2	..	..	..	..	1	50.0	1	50.0
Rectum	24	1.9	2	8.3	6	25.0	11	45.9	5	20.8
Retroperitoneal gland	2	0.2	..	..	1	50.0	..	..	1	50.0
Female Generative Organs:										
Broad ligament	1	0.1	..	..	..	..	1	100.0	..	..
Ovary	6	0.5	..	..	4	66.7	1	16.7	1	16.7
Pelvic organs (not specified)	2	0.2	..	..	..	..	1	50.0	1	50.0
Uterus	174	14.0	20	11.5	39	22.4	89	51.2	26	14.9
Vulva	6	0.5	1	16.7	3	50.0	1	16.7	1	16.7
Breast	56	4.5	14	25.0	14	25.0	19	33.9	9	16.1
Skin:										
Ear	7	0.6	..	..	4	57.1	3	42.9	..	..
Face	79	6.3	17	21.5	21	26.6	27	34.2	14	17.7
Head	1	0.1	1	100.0	..	..	..	..	..	..
Nose	22	1.8	7	31.8	6	27.3	8	36.4	1	4.5
Scalp	12	1.0	1	8.3	4	33.3	5	41.7	2	16.7
Other Organs or Parts:										
Abdomen	5	0.4	1	20.0	1	20.0	3	60.0	..	..
Antrum Highmore	..	..	..	..	..	..	..	..	..	..
Arm	13	1.0	2	15.4	2	15.4	7	53.8	2	15.4
Axilla	1	0.1	..	..	1	100.0	..	..	..	..
Back	3	0.2	2	66.7	1	33.3	..	..	..	..
Bladder	7	0.6	..	..	1	14.2	3	42.9	3	42.9
Brain	1	0.1	..	..	..	..	..	..	1	100.0

*Rate per 100,000 population.

Table 104 (concluded)
Cancer in the Charity Hospital of New Orleans, 1908-1912

WHITE PATIENTS

ORGAN OR PART	Admissions		Cured		Improved		Stationary		Died	
	Number	Rate*	Number	Per Cent. of Admitted	Number	Per Cent. of Admitted	Number	Per Cent. of Admitted	Number	Per Cent. of Admitted
Other Organs or Parts (*Cont.*):										
Cervical gland	2	0.2	..	..	..	..	1	50.0	1	50.0
Eye	15	1.2	2	13.3	8	53.4	3	20.0	2	13.3
Eyelid	6	0.5	2	33.3	2	33.3	2	33.3	..	..
Foot	3	0.2	2	66.7	1	33.3	..	..	..	..
Gluteal region	1	0.1	..	..	1	100.0	..	..	..	..
Hand	8	0.6	2	25.0	4	50.0	2	25.0	..	..
Hip	2	0.2	1	50.0	..	..	1	50.0	..	..
Inguinal	6	0.5	..	..	2	33.3	2	33.3	2	33.3
Kidney	4	0.3	..	..	..	..	4	100.0	..	..
Larynx	10	0.8	..	..	..	..	1	10.0	9	90.0
Leg	39	3.1	8	20.5	9	23.1	17	43.6	5	12.8
Lung	1	0.1	..	..	..	..	..	..	1	100.0
Lymphatic gland	3	0.2	1	33.3	..	..	1	33.3	1	33.3
Mediastinum	3	0.2	..	..	1	33.3	1	33.3	1	33.3
Multiple	1	0.1	..	..	..	..	1	100.0	..	..
Neck	42	3.4	13	31.0	8	19.0	14	33.3	7	16.7
Pancreas	2	0.2	..	..	..	..	..	..	2	100.0
Parotid gland	3	0.2	..	..	1	33.3	1	33.3	1	33.3
Pectoral muscles	..	..	..	..	..	..	..	..	..	..
Penis	18	1.4	9	50.0	2	11.1	6	33.3	1	5.6
Prostate gland	4	0.3	..	..	1	25.0	1	25.0	2	50.0
Pubic	2	0.2	..	..	1	50.0	1	50.0	..	..
Ribs	..	..	..	..	..	..	..	..	..	..
Scapula	1	0.1	..	..	1	100.0	..	..	..	..
Skull	1	0.1	..	..	..	..	1	100.0	..	..
Spleen	2	0.2	..	..	1	50.0	1	50.0	..	..
Sternum	2	0.2	..	..	..	..	2	100.0	..	..
Testicle	13	1.0	5	38.4	4	30.8	2	15.4	2	15.4
Thorax	5	0.4	2	40.0	1	20.0	2	40.0	..	..
Thyroid gland	3	0.2	..	..	..	..	..	..	3	100.0

*Rate per 100,000 population.

COLORED PATIENTS

ORGAN OR PART	Admissions		Cured		Improved		Stationary		Died	
	Number	Rate*	Number	Per Cent. of Admitted	Number	Per Cent. of Admitted	Number	Per Cent. of Admitted	Number	Per Cent. of Admitted
Buccal cavity	51	11.4	12	23.5	10	19.6	26	51.0	3	5.9
Stomach and liver	52	11.6	..	..	7	13.5	21	40.4	24	46.1
Peritoneum, intestines and rectum	25	5.6	..	..	2	8.0	12	48.0	11	44.0
Female generative organs	166	37.0	16	9.6	48	28.9	75	45.2	27	16.3
Breast	65	14.5	16	24.6	22	33.8	22	33.8	5	7.7
Skin	9	2.0	3	33.3	3	33.3	2	22.2	1	11.1
Other organs or parts	125	27.9	34	27.2	30	24.0	33	26.4	28	22.4
All organs and parts	493	110.0	81	16.4	122	24.8	191	38.7	99	20.1
Buccal Cavity:										
Cheek	1	0.2	..	..	1	100.0	..	..	..	..
Gum	1	0.2	..	..	..	..	1	100.0	..	..
Lip	3	0.7	2	66.7	..	..	1	33.3	..	..
Maxilla	34	7.6	8	23.5	7	20.6	17	50.0	2	5.9
Mouth	3	0.7	1	33.3	1	33.3	1	33.3	..	..
Tongue	8	1.8	1	12.5	1	12.5	5	62.5	1	12.5
Tonsil	1	0.2	..	..	..	..	1	100.0	..	..
Stomach and Liver:										
Liver	14	3.1	..	..	3	21.4	7	50.0	4	28.6
Pharynx	1	0.2	..	..	..	..	..	..	1	100.0
Stomach	37	8.3	..	..	4	10.8	14	37.8	19	51.4
Peritoneum, Intestines and Rectum:										
Abdominal viscera	1	0.2	..	..	..	..	1	100.0	..	..
Ileum	1	0.2	..	..	..	..	..	..	1	100.0
Intestines	8	1.8	..	..	1	12.5	5	62.5	2	25.0
Mesentery	2	0.4	..	..	..	..	1	50.0	1	50.0
Omentum	2	0.4	..	..	..	..	..	..	2	100.0
Rectum	11	2.5	..	..	1	9.0	5	45.5	5	45.5

*Rate per 100,000 population.

Table 105 (continued)
Cancer in the Charity Hospital of New Orleans, 1908-1912

COLORED PATIENTS

ORGAN OR PART	Admissions		Cured		Improved		Stationary		Died	
	Number	Rate*	Number	Per Cent. of Admitted	Number	Per Cent. of Admitted	Number	Per Cent. of Admitted	Number	Per Cent. of Admitted
Female Generative Organs:										
Ovary	7	1.6	4	57.1	2	28.6	..	..	1	14.3
Uterus	150	33.5	12	8.0	44	29.3	70	46.7	24	16.0
Vulva	9	2.0	..	..	2	22.2	5	55.6	2	22.2
Breast	65	14.5	16	24.6	22	33.8	22	33.8	5	7.7
Skin:										
Face	3	0.7	..	..	2	66.7	..	..	1	33.3
Head	1	0.2	1	100.0	..	..	..	..	..	..
Nose	3	0.7	1	33.3	1	33.3	1	33.3	..	..
Scalp	2	0.4	1	50.0	..	..	1	50.0	..	..
Other Organs or Parts:										
Abdomen	1	0.2	..	..	..	..	..	..	1	100.0
Antrum Highmore	3	0.7	..	..	3	100.0	..	..	..	..
Arm	6	1.3	..	..	2	33.3	2	33.3	2	33.3
Axilla	3	0.7	1	33.3	1	33.3	1	33.3	..	..
Back	4	0.9	2	50.0	2	50.0	..	..	..	..
Bladder	3	0.7	..	..	..	..	2	66.7	1	33.3
Brain	..	..	..	..	..	..	..	..	..	..
Eye	6	1.3	2	33.3	1	16.7	2	33.3	1	16.7
Foot	1	0.2	1	100.0	..	..	..	..	..	..
Hand	3	0.7	1	33.3	1	33.3	1	33.3	..	..
Inguinal	3	0.7	1	33.3	..	..	1	33.3	1	33.3
Kidney	3	0.7	..	..	..	..	1	33.3	2	66.7
Larynx	1	0.2	..	..	1	100.0	..	..	..	..
Leg	34	7.6	9	26.5	9	26.5	9	26.5	7	20.5
Lung	2	0.4	..	..	..	..	1	50.0	1	50.0

Table 105 (concluded)
Cancer in the Charity Hospital of New Orleans, 1908-1912

COLORED PATIENTS

ORGAN OR PART	Admissions		Cured		Improved		Stationary		Died	
Other Organs or Parts (*Cont.*):	Number	Rate*	Number	Per Cent.of Admitted	Number	Per Cent.of Admitted	Number	Per Cent.of Admitted	Number	Per Cent.of Admitted
Multiple	1	0.2	1	100.0	..	..	..	..	..	..
Neck	5	1.1	2	40.0	1	20.0	2	40.0	..	..
Pancreas	2	0.4	..	..	..	..	1	50.0	1	50.0
Parotid gland	1	0.2	..	..	..	..	1	100.0	..	..
Pectoral muscles	2	0.4	..	..	..	..	1	50.0	1	50.0
Penis	14	3.1	7	50.0	3	21.4	2	14.3	2	14.3
Prostate gland	8	1.8	2	25.0	2	25.0	2	25.0	2	25.0
Pubic	1	0.2	..	..	1	100.0	..	..	..	..
Ribs	2	0.4	..	..	..	..	1	50.0	1	50.0
Scapula	3	0.7	..	..	1	33.3	..	..	2	66.7
Skull	1	0.2	..	..	..	..	..	..	1	100.0
Spleen	1	0.2	..	..	..	..	1	100.0	..	..
Sternum	1	0.2	..	..	..	..	1	100.0	..	..
Tesitcle	7	1.6	5	71.4	1	14.3	1	14.3	..	..

*Rate per 100,000 population.

For an extended discussion of the Charity Hospital experience, with special reference to tumor formation in the white and colored races, see "The Surgical Peculiarities of the American Negro," by Rudolph Matas, in Transactions of the American Surgical Association, 1896, pp. 74-88.

APPENDIX F (PART II)

Table 106
Mortality from Cancer in Greater New York
1891-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	1,568,830	902	57.5	1906	4,235,007	3,005	71.0
1892	1,622,359	996	61.4	1907	4,367,976	3,227	73.9
1893	1,675,888	993	59.3	1908	4,500,945	3,243	72.1
1894	1,729,417	1,022	59.1	1909	4,633,914	3,488	75.3
1895	1,782,947	1,030	57.8	1910	4,766,883	3,710	77.8
1891-1895	8,379,441	4,943	59.0	1906-1910	22,504,725	16,673	74.1
1896	1,836,477	1,141	62.1	1911	4,899,852	3,873	79.0
1897	1,890,007	1,217	64.4	1912	5,032,821	4,071	80.9
1898	3,171,268	2,006	63.3	1913	5,165,790	4,223	81.7
1899	3,304,235	2,136	64.6	1914	5,298,759	4,467	84.3
1900	3,437,202	2,291	66.7				
1896-1900	13,639,189	8,791	64.5				
1901	3,570,169	2,463	69.0				
1902	3,703,136	2,450	66.2				
1903	3,836,103	2,608	68.0				
1904	3,969,071	2,709	68.3				
1905	4,102,039	2,875	70.1				
1901-1905	19,180,518	13,105	68.3				

Source: Annual Reports of the Board of Health of the City of New York, N. Y.

Table 107
Mortality from Cancer in Greater New York, Males
1891-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	774,822	318	41.0	1906	2,111,770	1,174	55.6
1892	802,065	356	44.4	1907	2,179,448	1,322	60.7
1893	829,308	383	46.2	1908	2,247,126	1,241	55.2
1894	856,551	362	42.3	1909	2,314,804	1,442	62.3
1895	883,795	391	44.2	1910	2,382,482	1,524	64.0
1891-1895	4,146,541	1,810	43.7	1906-1910	11,235,630	6,703	59.7
1896	911,039	449	49.2	1911	2,450,160	1,602	65.4
1897	938,283	474	50.5	1912	2,517,838	1,668	66.2
1898	1,570,351	773	49.2	1913	2,585,516	1,740	67.3
1899	1,638,028	785	47.9				
1900	1,705,705	826	48.4				
1896-1900	6,763,406	3,307	48.9				
1901	1,773,382	935	52.7				
1902	1,841,059	922	50.1				
1903	1,908,736	1,014	53.1				
1904	1,976,414	1,071	54.2				
1905	2,044,092	1,134	55.5				
1901-1905	9,543,683	5,076	53.2				

Source: Annual Reports of the Board of Health of the City of New York, N. Y.

APPENDIX F (PART II)

Table 108
Mortality from Cancer in Greater New York, Females
1891-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
	794,008	584	73.6
	820,294	640	78.0
	846,580	610	72.1
	872,866	660	75.6
	899,152	639	71.1
95	4,232,900	3,133	74.0
	925,438	692	74.8
	951,724	743	78.1
	1,600,917	1,233	77.0
	1,666,207	1,351	81.1
	1,731,497	1,465	84.6
00	6,875,783	5,484	79.8
	1,796,787	1,528	85.0
	1,862,077	1,528	82.1
	1,927,367	1,594	82.7
	1,992,657	1,638	82.2
	2,057,947	1,741	84.6
05	9,636,835	8,029	83.3
1906	2,123,237	1,831	86.2
1907	2,188,528	1,905	87.0
1908	2,253,819	2,002	88.8
1909	2,319,110	2,046	88.2
1910	2,384,401	2,186	91.7
1906-1910	11,269,095	9,970	88.5
1911	2,449,692	2,271	92.7
1912	2,514,983	2,403	95.5
1913	2,580,274	2,483	96.2

Source: Annual Reports of the Board of Health of the City of New York, N. Y.

Table 109
Mortality from Cancer in Greater New York, by Age
1893-1912

Years	All Ages* Population	Deaths from Cancer	Rate per 100,000 Population
97	8,914,736	5,403	60.6
02	17,186,010	11,346	66.0
07	20,510,196	14,424	70.3
12	23,834,415	18,385	77.1
	Ages Under 35		
97	6,260,890	455	7.3
02	11,961,215	845	7.1
07	14,177,740	1,054	7.4
12	16,394,286	1,247	7.6

iding unknown ages.

Years	Ages 35-54 Population	Deaths from Cancer	Rate per 100,000 Population
1893-1897	2,006,992	2,334	116.3
1898-1902	3,911,885	4,757	121.6
1903-1907	4,752,536	5,833	122.7
1908-1912	5,593,211	7,252	129.7
	Ages 55 and Over		
1893-1897	625,440	2,614	417.9
1898-1902	1,285,750	5,744	446.7
1903-1907	1,549,306	7,537	486.5
1908-1912	1,812,910	9,886	545.3

APPENDIX F (PART II)

Table 110
Mortality from Cancer in Greater New York, by Age, Males
1893-1912

Years	Population	Deaths from Cancer	Rate per 100,000 Population
All Ages*			
1893-1897	4,418,976	2,059	46.6
1898-1902	8,528,525	4,241	49.7
1903-1907	10,220,460	5,715	55.9
1908-1912	11,912,410	7,477	62.8
Ages Under 35			
1893-1897	3,062,165	174	5.7
1898-1902	5,865,080	328	5.6
1903-1907	6,997,730	444	6.3
1908-1912	8,130,386	501	6.2

*Including unknown ages.

Years	Population	Deaths from Cancer	Rate per 100,000 Population
Ages 35-54			
1893-1897	1,047,346	811	77.4
1898-1902	2,037,950	1,589	78.0
1903-1907	2,465,050	2,056	83.4
1908-1912	2,892,156	2,569	88.8
Ages 55 and Over			
1893-1897	296,285	1,074	362.5
1898-1902	607,030	2,324	382.8
1903-1907	735,455	3,215	437.1
1908-1912	863,890	4,407	510.1

Table 111
Mortality from Cancer in Greater New York, by Age, Females
1893-1912

Years	Population	Deaths from Cancer	Rate per 100,000 Population
All Ages*			
1893-1897	4,495,760	3,344	74.4
1898-1902	8,657,485	7,105	82.1
1903-1907	10,289,736	8,709	84.6
1908-1912	11,922,005	10,908	91.5
Ages Under 35			
1893-1897	3,198,725	281	8.8
1898-1902	6,096,135	517	8.5
1903-1907	7,180,010	610	8.5
1908-1912	8,263,900	746	9.0

*Including unknown ages

Years	Population	Deaths from Cancer	Rate per 100,000 Population
Ages 35-54			
1893-1897	959,646	1,523	158.7
1898-1902	1,873,935	3,168	169.1
1903-1907	2,287,486	3,777	165.1
1908-1912	2,701,055	4,683	173.4
Ages 55 and Over			
1893-1897	329,155	1,540	467.9
1898-1902	678,720	3,420	503.9
1903-1907	813,851	4,322	531.1
1908-1912	949,020	5,479	577.3

Table 12

lity from Cancer of the Buccal Cavity, according to Sex Greater New York

1903-1912

TOTAL

	Population	Deaths from Cancer	Rate per 100,000 Population
	3,836,103	127	3.3
	3,969,071	88	2.2
	4,102,039	108	2.6
	4,235,007	113	2.7
	4,367,976	128	2.9
	4,500,945	111	2.5
	4,633,914	131	2.8
	4,766,883	140	2.9
	4,899,852	131	2.7
	5,032,821	153	3.0
)12	44,344,611	1,230	2.8
	MALES		
	1,908,736	101	5.3
	1,976,414	67	3.4
	2,044,092	88	4.3
	2,111,770	93	4.4
	2,179,448	103	4.7
	2,247,126	95	4.2
	2,314,804	116	5.0
	2,382,482	119	5.0
	2,450,160	109	4.4
	2,517,838	123	4.9
)12	22,132,870	1,014	4.6
	FEMALES		
	1,927,367	26	1.3
	1,992,657	21	1.1
	2,057,947	20	1.0
	2,123,237	20	0.9
	2,188,528	25	1.1
	2,253,819	16	0.7
	2,319,110	15	0.6
	2,384,401	21	0.9
	2,449,692	22	0.9
	2,514,983	30	1.2
12	22,211,741	216	1.0

Table 113

Mortality from Cancer of Stomach and Liver, according to Sex Greater New York

1903-1912

TOTAL

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1903	3,836,103	1,043	27.2
1904	3,969,071	1,141	28.7
1905	4,102,039	1,135	27.7
1906	4,235,007	1,235	29.2
1907	4,367,976	1,281	29.3
1908	4,500,945	1,316	29.2
1909	4,633,914	1,421	30.7
1910	4,766,883	1,433	30.1
1911	4,899,852	1,543	31.5
1912	5,032,821	1,608	32.0
1903-1912	44,344,611	13,156	29.7
	MALES		
1903	1,908,736	538	28.2
1904	1,976,414	562	28.4
1905	2,044,092	568	27.8
1906	2,111,770	591	28.0
1907	2,179,448	667	30.6
1908	2,247,126	626	27.9
1909	2,314,804	753	32.5
1910	2,382,482	713	29.9
1911	2,450,160	791	32.3
1912	2,517,838	801	31.8
1903-1912	22,132,870	6,610	29.9
	FEMALES		
1903	1,927,367	505	26.2
1904	1,992,657	579	29.1
1905	2,057,947	567	27.6
1906	2,123,237	644	30.3
1907	2,188,528	614	28.1
1908	2,253,819	690	30.6
1909	2,319,110	668	28.8
1910	2,384,401	720	30.2
1911	2,449,692	752	30.7
1912	2,514,983	807	32.1
1903-1912	22,211,741	6,546	29.5

APPENDIX F. (PART II)

Table 114
Mortality from Cancer of Peritoneum, Intestines, Rectum according to Sex, Greater New York
1903-1912

TOTAL				MALES			
Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1903	3,836,103	342	8.9	1903	1,908,736	146	7.6
1904	3,969,071	355	8.9	1904	1,976,414	164	8.3
1905	4,102,039	399	9.7	1905	2,044,092	179	8.8
1906	4,235,007	427	10.1	1906	2,111,770	183	8.7
1907	4,367,976	467	10.7	1907	2,179,448	211	9.7
1908	4,500,945	461	10.2	1908	2,247,126	183	8.1
1909	4,633,914	459	9.9	1909	2,314,804	223	9.6
1910	4,766,883	602	12.6	1910	2,382,482	285	12.0
1911	4,899,852	544	11.1	1911	2,450,160	257	10.5
1912	5,032,821	608	12.1	1912	2,517,838	279	11.1
1903-1912	44,344,611	4,664	10.5	1903-1912	22,132,870	2,110	9.5

FEMALES

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1903	1,927,367	196	10.2
1904	1,992,657	191	9.6
1905	2,057,947	220	10.7
1906	2,123,237	244	11.5
1907	2,188,528	256	11.7
1908	2,253,819	278	12.3
1909	2,319,110	236	10.2
1910	2,384,401	317	13.3
1911	2,449,692	287	11.7
1912	2,514,983	329	13.1
1903-1912	22,211,741	2,554	11.5

Table 115
Mortality from Cancer of Female Generative Organs Greater New York, 1903-1912

Year	Female Population	Deaths from Cancer	Rate per 100,000 Population
1903	1,927,367	424	22.0
1904	1,992,657	419	21.0
1905	2,057,947	478	23.2
1906	2,123,237	447	21.1
1907	2,188,528	494	22.6
1908	2,253,819	543	24.1
1909	2,319,110	557	24.0
1910	2,384,401	553	23.2
1911	2,449,692	551	22.5
1912	2,514,983	580	23.1
1903-1912	22,211,741	5,046	22.7

Table 116
Mortality from Cancer of Female Breast Greater New York, 1903-1912

Year	Female Population	Deaths from Cancer	Rate per 100,000 Population
1903	1,927,367	253	13.1
1904	1,992,657	239	12.0
1905	2,057,947	265	12.9
1906	2,123,237	268	12.6
1907	2,188,528	283	12.9
1908	2,253,819	267	11.8
1909	2,319,110	314	13.5
1910	2,384,401	348	14.6
1911	2,449,692	361	14.7
1912	2,514,983	346	13.8
1903-1912	22,211,741	2,944	13.3

Table 117

ality from Cancer of the Skin according to Sex
eater New York, 1903-1912

TOTAL

	Population	Deaths from Cancer	Rate per 100,000 Population
3	3,836,103	78	2.0
4	3,969,071	74	1.9
5	4,102,039	83	2.0
6	4,235,007	73	1.7
7	4,367,976	72	1.6
8	4,500,945	63	1.4
9	4,633,914	74	1.6
0	4,766,883	74	1.6
1	4,899,852	64	1.3
2	5,032,821	70	1.4
912	44,344,611	725	1.6

MALES

	Population	Deaths from Cancer	Rate per 100,000 Population
3	1,908,736	51	2.7
4	1,976,414	45	2.3
5	2,044,092	65	3.2
6	2,111,770	52	2.5
7	2,179,448	38	1.7
8	2,247,126	34	1.5
9	2,314,804	43	1.9
0	2,382,482	49	2.1
1	2,450,160	42	1.7
2	2,517,838	43	1.7
912	22,132,870	462	2.1

FEMALES

	Population	Deaths from Cancer	Rate per 100,000 Population
3	1,927,367	27	1.4
4	1,992,657	29	1.5
5	2,057,947	18	0.9
6	2,123,237	21	1.0
7	2,188,528	34	1.6
8	2,253,819	29	1.3
9	2,319,110	31	1.3
0	2,384,401	25	1.0
1	2,449,692	22	0.9
2	2,514,983	27	1.1
912	22,211,741	263	1.2

Table 118

Mortality from Cancer of Other or Not Specified Organs, according to Sex, Greater New York, 1903-1912

TOTAL

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1903	3,836,103	341	8.9
1904	3,969,071	393	9.9
1905	4,102,039	407	9.9
1906	4,235,007	442	10.4
1907	4,367,976	502	11.5
1908	4,500,945	482	10.7
1909	4,633,914	532	11.5
1910	4,766,883	560	11.7
1911	4,899,852	679	13.9
1912	5,032,821	706	14.0
1903-1912	44,344,611	5,044	11.4

MALES

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1903	1,908,736	178	9.3
1904	1,976,414	233	11.8
1905	2,044,092	234	11.4
1906	2,111,770	255	12.1
1907	2,179,448	303	13.9
1908	2,247,126	303	13.5
1909	2,314,804	307	13.3
1910	2,382,482	358	15.0
1911	2,450,160	403	16.4
1912	2,517,838	422	16.8
1903-1912	22,132,870	2,996	13.5

FEMALES

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1903	1,927,367	163	8.5
1904	1,992,657	160	8.0
1905	2,057,947	173	8.4
1906	2,123,237	187	8.8
1907	2,188,528	199	9.1
1908	2,253,819	179	7.9
1909	2,319,110	225	9.7
1910	2,384,401	202	8.5
1911	2,449,692	276	11.3
1912	2,514,983	284	11.3
1903-1912	22,211,741	2,048	9.2

APPENDIX F (PART II)

Table 119

Mortality from Cancer in Greater New York, by Organs and Parts 1903-1907 Compared with 1908-1912

Organ or Part	1903-1907 Deaths from Cancer	1903-1907 Rate per 100,000 Population	1908-1912 Deaths from Cancer	1908-1912 Rate per 100,000 Population	Percentage of Increase
Buccal cavity	564	2.7	666	2.8	3.7
Stomach and liver	5,835	28.4	7,321	30.7	8.1
Peritoneum, intestines and rectum	1,990	9.7	2,674	11.2	15.4
Female generative organs	2,262	11.0	2,784	11.7	6.4
Female breast	1,308	6.4	1,636	6.9	7.8
Skin	380	1.9	345	1.4	−26.3
Other or not specified organs	2,085	10.2	2,959	12.4	21.6
All organs	14,424	70.3	18,385	77.1	9.7

Table 120

Mortality from Cancer in Greater New York, by Organs and Parts according to Sex, 1903-1907 Compared with 1908-1912

Organ or Part	1903-1907 Deaths from Cancer	1903-1907 Rate per 100,000 Population	1908-1912 Deaths from Cancer	1908-1912 Rate per 100,000 Population	Percentage of Increase
MALES					
Buccal cavity	452	4.4	562	4.7	6.8
Stomach and liver	2,926	28.6	3,684	30.9	8.0
Peritoneum, intestines and rectum	883	8.6	1,227	10.3	19.8
Skin	251	2.5	211	1.8	−28.0
Other or not specified organs	1,203	11.8	1,793	15.1	28.0
All organs	5,715	55.9	7,477	62.8	12.3
FEMALES					
Buccal cavity	112	1.1	104	0.9	−18.2
Stomach and liver	2,909	28.2	3,637	30.5	8.2
Peritoneum, intestines and rectum	1,107	10.8	1,447	12.1	12.0
Female generative organs	2,262	22.0	2,784	23.4	6.4
Breast	1,308	12.7	1,636	13.7	7.9
Skin	129	1.3	134	1.1	−15.4
Other or not specified organs	882	8.3	1,166	9.8	18.1
All organs	8,709	84.4	10,908	91.5	8.4

Table 121

lty from Cancer in Greater New York, by Boroughs, according to Sex 1903-1912

oughs	Population	Deaths from Cancer	Rate per 100,000 Population
TOTAL			
tan	22,111,795	17,854	80.7
	3,733,606	2,546	68.2
n	15,174,082	10,273	67.7
	2,512,791	1,429	56.9
ıd	812,311	707	87.0
New York	44,344,585	32,809	74.0
MALES			
tan	11,045,590	7,555	68.4
	1,882,781	970	51.5
n	7,507,760	3,807	50.7
	1,275,400	516	40.5
ıd	421,320	344	81.6
New York	22,132,851	13,192	59.6
FEMALES			
tan	11,066,205	10,299	93.1
	1,850,825	1,576	85.2
n	7,666,322	6,466	84.3
	1,237,391	913	73.8
ıd	390,991	363	92.8
New York	22,211,734	19,617	88.3

ɔe: For Tables 109 to 121, Annual Reports of the Board of Health of the City York, N. Y.

APPENDIX F (PART II)

Table 122

Mortality from Cancer in the City of New York (Manhattan and Bronx) 1871-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1871	968,692	335	34.6
1872	995,092	392	39.4
1873	1,021,492	425	41.6
1874	1,047,893	416	39.7
1875	1,074,294	424	39.5
1871-1875	5,107,463	1,992	39.0
1876	1,100,695	459	41.7
1877	1,127,096	495	43.9
1878	1,153,497	570	49.4
1879	1,179,898	572	48.5
1880	1,206,299	659	54.6
1876-1880	5,767,485	2,755	47.8
1881	1,237,198	706	57.1
1882	1,268,097	732	57.7
1883	1,298,996	678	52.2
1884	1,329,896	731	55.0
1885	1,360,796	754	55.4
1881-1885	6,494,983	3,601	55.4
1886	1,391,697	779	56.0
1887	1,422,598	832	58.5
1888	1,453,499	870	59.9
1889	1,484,400	848	57.1
1890	1,515,301	954	63.0
1886-1890	7,267,495	4,283	58.9
1891	1,568,830	902	57.5
1892	1,622,359	996	61.4
1893	1,675,888	993	59.3
1894	1,729,417	1,022	59.1
1895	1,782,947	1,030	57.8
1891-1895	8,379,441	4,943	59.0
1896	1,836,477	1,141	62.1
1897	1,890,007	1,217	64.4
1898	1,943,538	1,260	64.8
1899	1,997,069	1,321	66.1
1900	2,050,600	1,473	71.8
1896-1900	9,717,691	6,412	66.0
1901	2,121,791	1,575	74.2
1902	2,192,982	1,536	70.0
1903	2,264,174	1,684	74.4
1904	2,335,366	1,740	74.5
1905	2,406,558	1,834	76.2
1901-1905	11,320,871	8,369	73.9
1906	2,477,750	1,856	74.9
1907	2,548,943	2,032	79.7
1908	2,620,136	2,020	77.1
1909	2,691,329	2,123	78.9
1910	2,762,522	2,238	81.0
1906-1910	13,100,680	10,269	78.4
1911	2,833,714	2,376	83.8
1912	2,904,907	2,497	86.0
1913	2,976,099	2,532	85.1

Source: Annual Reports of the Board of Health of the City of New York, N. Y.

Table 123

ality from Cancer in the City of New York (Manhattan and Bronx)
Males, 1871-1913

	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1	470,456	93	19.8	1896	911,039	449	49.3
2	483,795	114	23.6	1897	938,283	474	50.5
3	497,134	138	27.8	1898	965,527	497	51.5
4	510,474	124	24.3	1899	992,771	509	51.3
5	523,814	147	28.1	1900	1,020,015	558	54.7
875	2,485,673	616	24.8	1896-1900	4,827,635	2,487	51.5
6	537,154	152	28.3	1901	1,056,391	629	59.5
7	550,494	153	27.8	1902	1,092,767	590	54.0
8	563,834	182	32.3	1903	1,129,143	655	58.0
9	577,174	193	33.4	1904	1,165,519	710	60.9
0	590,514	219	37.1	1905	1,201,895	768	63.9
880	2,819,170	899	31.9	1901-1905	5,645,715	3,352	59.4
1	606,220	244	40.2	1906	1,238,271	766	61.9
2	621,926	265	42.6	1907	1,274,648	839	65.8
3	637,632	221	34.7	1908	1,311,025	827	63.1
4	653,338	263	40.3	1909	1,347,402	920	68.3
5	669,044	228	34.1	1910	1,383,779	982	71.0
885	3,188,160	1,221	38.3	1906-1910	6,555,125	4,334	66.1
6	684,751	257	37.5	1911	1,420,155	1,008	71.0
7	700,458	278	39.7	1912	1,456,532	1,050	72.1
8	716,165	284	39.7	1913	1,492,908	1,072	71.8
9	731,872	276	37.7				
0	747,579	356	47.6				
890	3,580,825	1,451	40.5				
1	774,822	318	41.0				
2	802,065	356	44.4				
3	829,308	383	46.2				
4	856,551	362	42.3				
5	883,795	391	44.2				
895	4,146,541	1,810	43.7				

Source: Annual Reports of the Board of Health of the City of New York, N. Y.

Table 124

Mortality from Cancer in the City of New York (Manhattan and Bronx) Females, 1871-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1871	498,236	242	48.6
1872	511,297	278	54.4
1873	524,358	287	54.7
1874	537,419	292	54.3
1875	550,480	277	50.3
1871-1875	2,621,790	1,376	52.5
1876	563,541	307	54.5
1877	576,602	342	59.3
1878	589,663	388	65.8
1879	602,724	379	62.9
1880	615,785	440	71.5
1876-1880	2,948,315	1,856	63.0
1881	630,978	462	73.2
1882	646,171	467	72.3
1883	661,364	457	69.1
1884	676,558	468	69.2
1885	691,752	526	76.0
1881-1885	3,306,823	2,380	72.0
1886	706,946	522	73.8
1887	722,140	554	76.7
1888	737,334	586	79.5
1889	752,528	572	76.0
1890	767,722	598	77.9
1886-1890	3,686,670	2,832	76.8
1891	794,008	584	73.6
1892	820,294	640	78.0
1893	846,580	610	72.1
1894	872,866	660	75.6
1895	899,152	639	71.1
1891-1895	4,232,900	3,133	74.0
1896	925,438	692	74.8
1897	951,724	743	78.1
1898	978,011	763	78.0
1899	1,004,298	812	80.9
1900	1,030,585	915	88.8
1896-1900	4,890,056	3,925	80.3
1901	1,065,400	946	88.8
1902	1,100,215	946	86.0
1903	1,135,031	1,029	90.7
1904	1,169,847	1,030	88.0
1905	1,204,663	1,066	88.5
1901-1905	5,675,156	5,017	88.4
1906	1,239,479	1,090	87.9
1907	1,274,295	1,193	93.6
1908	1,309,111	1,193	91.1
1909	1,343,927	1,203	89.5
1910	1,378,743	1,256	91.1
1906-1910	6,545,555	5,935	90.7
1911	1,413,559	1,368	96.8
1912	1,448,375	1,447	99.9
1913	1,483,191	1,460	98.4

Source: Annual Reports of the Board of Health of the City of New York, N. Y.

Table 125

Mortality from Cancer in Omaha, Neb., 1900-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	102,555	45	43.9
1901	104,709	60	57.3
1902	106,863	51	47.7
1903	109,017	54	49.5
1904	111,171	73	65.7
1905	113,325	87	76.8
1901-1905	545,085	325	59.6
1906	115,479	93	80.5
1907	117,633	108	91.8
1908	119,787	97	81.0
1909	121,941	101	82.8
1910	124,096	114	91.9
1906-1910	598,936	513	85.7
1911	126,250	112	88.7
1912	128,404	114	88.8
1913	130,558	129	98.8

Source: United States Mortality Statistics.

APPENDIX F (PART II)

Table 126
Mortality from Cancer in Philadelphia, Pa.
1861-1914

r	Population	Deaths from Cancer	Rate per 100,000 Population
1	576,378	189	32.8
2	587,227	181	30.8
3	598,076	190	31.8
4	608,925	180	29.6
864	2,370,606	740	31.2
6	630,623	203	32.2
7	641,472	200	31.2
8	652,322	236	36.2
9	663,172	232	35.0
0	674,022	261	38.7
870	3,261,611	1,132	34.7
1	691,336	280	40.5
2	708,650	316	44.6
3	725,964	268	36.9
4	743,278	308	41.4
5	760,593	318	41.8
875	3,629,821	1,490	41.0
6	777,908	305	39.2
7	795,223	327	41.1
8	812,538	380	46.8
9	829,854	362	43.6
0	847,170	368	43.4
880	4,062,693	1,742	42.9
1	867,148	417	48.1
2	887,126	429	48.4
3	907,104	405	44.6
4	927,084	476	51.3
5	947,064	487	51.4
885	4,535,526	2,214	48.8
6	967,044	457	47.3
7	987,024	500	50.7
8	1,007,004	448	44.5
9	1,026,984	532	51.8
0	1,046,964	538	51.4
890	5,035,020	2,475	49.2

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	1,071,637	572	53.4
1892	1,096,310	571	52.1
1893	1,120,983	614	54.8
1894	1,145,656	589	51.4
1895	1,170,329	682	58.3
1891-1895	5,604,915	3,028	54.0
1896	1,195,002	676	56.6
1897	1,219,675	698	57.2
1898	1,244,349	671	53.9
1899	1,269,023	777	61.2
1900	1,293,697	810	62.6
1896-1900	6,221,746	3,632	58.4
1901	1,319,227	775	58.8
1902	1,344,757	860	64.0
1903	1,370,288	965	70.4
1904	1,395,819	1,037	74.3
1905	1,421,350	1,037	73.0
1901-1905	6,851,441	4,674	68.2
1906	1,446,881	1,125	77.8
1907	1,472,412	1,164	79.1
1908	1,497,944	1,235	82.4
1909	1,523,476	1,306	85.7
1910	1,549,008	1,304	84.2
1906-1910	7,489,721	6,134	81.9
1911	1,574,540	1,354	86.0
1912	1,600,072	1,411	88.2
1913	1,625,604	1,551	95.4
1914	1,651,136	1,534	92.9

Source: Annual Reports of the Bureau of Health of the City of Philadelphia, Pa.

APPENDIX F (PART II)

Table 127
Mortality from Cancer in Philadelphia, Pa., Males
1861-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1861	274,437	64	23.3
1862	279,541	59	21.1
1863	284,645	52	18.3
1864	289,749	49	16.9
1861-1864	1,128,372	224	19.9
1866	299,959	55	18.3
1867	305,064	50	16.4
1868	310,169	75	24.2
1869	315,274	65	20.6
1870	320,379	77	24.0
1866-1870	1,550,845	322	20.8
1871	328,938	84	25.5
1872	337,497	108	32.0
1873	346,056	77	22.3
1874	354,615	93	26.2
1875	363,175	100	27.5
1871-1875	1,730,281	462	26.7
1876	371,735	102	27.4
1877	380,295	108	28.4
1878	388,855	120	30.9
1879	397,415	105	26.4
1880	405,975	100	24.6
1876-1880	1,944,275	535	27.5
1881	416,489	127	30.5
1882	427,003	145	34.0
1883	437,517	132	30.2
1884	448,032	134	29.9
1885	458,547	143	31.2
1881-1885	2,187,588	681	31.1
1886	469,062	118	25.2
1887	479,577	140	29.2
1888	490,092	126	25.7
1889	500,607	175	35.0
1890	511,122	171	33.5
1886-1890	2,450,460	730	29.8
1891	523,458	186	35.5
1892	535,794	183	34.2
1893	548,130	183	33.4
1894	560,466	188	33.5
1895	572,802	211	36.8
1891-1895	2,740,650	951	34.7
1896	585,138	242	41.4
1897	597,474	244	40.8
1898	609,811	205	33.6
1899	622,148	252	40.5
1900	634,485	298	47.0
1896-1900	3,049,056	1,241	40.7
1901	647,082	288	44.5
1902	659,679	295	44.7
1903	672,277	341	50.7
1904	684,875	364	53.1
1905	697,473	369	52.9
1901-1905	3,361,386	1,657	49.3
1906	710,071	392	55.2
1907	722,669	432	59.8
1908	735,267	470	63.9
1909	747,865	519	69.4
1910	760,463	487	64.0
1906-1910	3,676,335	2,300	62.6
1911	773,061	520	67.3
1912	785,659	544	69.2
1913	798,257	612	76.7
1914	810,855	588	72.5

Source: Annual Reports of the Bureau of Health of the City of Philadelphia, Pa.

APPENDIX F (PART II)

Table 128
Mortality from Cancer in Philadelphia, Pa., Females
1861-1914

	Population	Deaths from Cancer	Rate per 100,000 Population
	301,941	125	41.4
	. 307,686	122	39.7
	313,431	138	44.0
	319,176	131	41.0
64	1,242,234	516	41.5
	330,664	148	44.8
	336,408	150	44.6
	342,153	161	47.1
	347,898	167	48.0
	353,643	184	52.0
70	1,710,766	810	47.3
	362,398	196	54.1
	371,153	208	56.0
	379,908	191	50.3
	388,663	215	55.3
	397,418	218	54.9
75	1,899,540	1,028	54.1
	406,173	203	50.0
	414,928	219	52.8
	423,683	260	61.4
	432,439	257	59.4
	441,195	268	60.7
80	2,118,418	1,207	57.0
	450,659	290	64.4
	460,123	284	61.7
	469,587	273	58.1
	479,052	342	71.4
	488,517	344	70.4
85	2,347,938	1,538	65.3
	497,982	339	68.1
	507,447	360	70.9
	516,912	322	62.3
	526,377	357	67.8
	535,842	367	68.5
90	2,584,560	1,745	67.5

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	548,179	386	70.4
1892	560,516	388	69.2
1893	572,853	431	75.2
1894	585,190	401	68.5
1895	597,527	471	78.8
1891-1895	2,864,265	2,077	72.5
1896	609,864	434	71.2
1897	622,201	454	73.0
1898	634,538	466	73.4
1899	646,875	525	81.2
·1900	659,212	512	77.7
1896-1900	3,172,690	2,391	75.4
1901	672,145	487	72.5
1902	685,078	565	82.5
1903	698,011	624	89.4
1904	710,944	673	94.7
1905	723,877	668	92.3
1901-1905	3,490,055	3,017	86.4
1906	736,810	733	99.5
1907	749,743	732	97.6
1908	762,677	765	100.3
1909	775,611	787	101.5
1910	788,545	817	103.6
1906-1910	3,813,386	3,834	100.5
1911	801,479	834	104.1
1912	814,413	867	106.5
1913	827,347	939	113.5
1914	840,281	946	112.6

Source: Annual Reports of the Bureau of Health of the City of Philadelphia, Pa.

APPENDIX F (PART II)

Table 129

Mortality from Cancer in Philadelphia, Pa., by Organs and Parts according to Sex, 1878-1903 (Excluding 1897-1898)

Organ or Part	TOTAL Deaths from Cancer	TOTAL Rate per 100,000 Population	MALES Deaths from Cancer	MALES Rate per 100,000 Population	FEMALES Deaths from Cancer	FEMALES Rate per 100,000 Population
Buccal cavity	398	1.6	317	2.6	81	0.6
Œsophagus	87	0.3	67	0.5	20	0.2
Stomach	3,901	15.3	1,875	15.1	2,026	15.5
Liver	1,535	6.0	605	4.9	930	7.1
Rectum	438	1.7	196	1.6	242	1.9
Other intestines	408	1.6	154	1.2	254	1.9
Pancreas	137	0.5	71	0.6	66	0.5
Urinary organs	231	0.9	138	1.1	93	0.7
Female generative organs	3,070	12.1	..	..	3,070	23.5
Breast	1,719	6.8	35	0.3	1,684	12.9
Skin	441	1.7	256	2.1	185	1.4
Other or not specified organs	1,325	5.3	689	5.5	636	4.9
All organs	13,690	53.8	4,403	35.5	9,287	71.1

Source: Annual Reports of the Bureau of Health of the City of Philadelphia, Pa.

Table 130

Increase in the Mortality from Cancer in Philadelphia, Pa., by Organs and Parts, 1891-1902 Compared with 1903-1912

Organ or Part	Rate per 100,000 Population 1891-1902*	Rate per 100,000 Population 1903-1912	Percentage of Increase
Buccal cavity	1.6	3.1	93.8
Stomach and liver	24.7	29.4	19.0
Peritoneum Intestines and rectum	3.5	8.6	145.7
Female generative organs	12.1	13.9	14.9
Breast	7.0	8.7	24.3
Skin	1.9	3.5	84.2
Other or not specified organs	6.9	13.3	92.8
All organs	57.7	80.5	39.5

Source: Annual Reports of the Bureau of Health of the City of Philadelphia, Pa.

*1897 and 1898 not available.

APPENDIX F (PART II)

Table 131

Mortality from Cancer of the Buccal Cavity in Philadelphia, Pa. according to Age, 1881-1912

Years	Population	Deaths from Cancer	Rate per 100,000 Population	Years	Population	Deaths from Cancer	Rate per 100,000 Population
	Ages Under 20				Ages 40–49		
90	3,929,590	3	0.1	1881-1890	1,008,630	19	1.9
02*	4,450,560	1	0.0	1891-1902	1,412,790	32	2.3
12	5,394,240	9	0.2	1903-1912	1,844,770	66	3.6
	Ages 20–29				Ages 50–59		
90	1,929,053	1	0.1	1881-1890	672,701	27	4.0
02	2,508,823	1	0.0	1891-1902	888,693	51	5.7
12	2,976,065	5	0.2	1903-1912	1,150,485	145	12.6
	Ages 30–39				Ages 60 and Over		
90	1,394,740	5	0.4	1881-1890	624,080	86	13.8
02	1,939,360	10	0.5	1891-1902	796,733	97	12.2
12	2,481,095	16	0.6	1903-1912	977,620	226	23.1

Source: Annual Reports of the Bureau of Health of the City of Philadelphia, Pa.

*1897 and 1898 not available.

Table 132

Mortality from Cancer of Stomach and Liver in Philadelphia, Pa. according to Age, 1881-1912

Years	Population	Deaths from Cancer	Rate per 100,000 Population	Years	Population	Deaths from Cancer	Rate per 100,000 Population
	Ages Under 20				Ages 40–49		
90	3,929,590	13	0.3	1881-1890	1,008,630	321	31.8
02*	4,450,560	15	0.3	1891-1902	1,412,790	515	36.5
12	5,394,240	13	0.2	1903-1912	1,844,770	739	40.1
	Ages 20–29				Ages 50–59		
90	1,929,053	27	1.4	1881-1890	672,701	492	73.1
02	2,508,823	49	2.0	1891-1902	888,693	794	89.3
12	2,976,065	42	1.4	1903-1912	1,150,485	1,227	106.7
	Ages 30–39				Ages 60 and Over		
90	1,394,740	134	9.6	1881-1890	624,080	854	136.8
02	1,939,360	225	11.6	1891-1902	796,733	1,362	170.9
12	2,481,095	228	9.2	1903-1912	977,620	2,103	215.1

Source: Annual Reports of the Bureau of Health of the City of Philadelphia, Pa.

*1897 and 1898 not available.

APPENDIX F (PART II)

Table 133

Mortality from Cancer of Peritoneum, Intestines and Rectum in Philadelphia, Pa., according to Age, 1881-1912

Years	Population	Deaths from Cancer	Rate per 100,000 Population
Ages Under 20			
1881-1390	3,929,59C	2	0.1
1891-1902*	4,450,560	4	0.1
1903-1912	5,394,240	22	0.4
Ages 20–29			
1881-1890	1,929,053	9	0.5
1891-1902	2,508,823	8	0.3
1903-1912	2,976,065	39	1.3
Ages 30–39			
1881-1890	1,394,740	30	2.2
1891-1902	1,939,360	31	1.6
1903-1912	2,481,095	117	4.7
Ages 40–49			
1881-1890	1,008,630	50	5.0
1891-1902	1,412,790	77	5.5
1903-1912	1,844,770	213	11.5
Ages 50–59			
1881-1890	672,701	71	10.6
1891-1902	888,693	118	13.3
1903-1912	1,150,485	314	27.3
Ages 60 and Over			
1881-1890	624,080	117	18.7
1891-1902	796,733	178	22.3
1903-1912	977,620	571	58.4

Source: Annual Reports of the Bureau of Health of the City of Philadelphia, Pa.

*1897 and 1898 not available.

Table 134

Mortality from Cancer of Generative Organs in Philadelphia, Pa. according to Age, 1881-1912

Years	Population	Deaths from Cancer	Rate per 100,000 Population
Ages Under 20			
1881-1890	3,929,590	6	0.2
1891-1902*	4,450,560	..	..
1903-1912	5,394,240	8	0.2
Ages 20–29			
1881-1890	1,929,053	33	1.7
1891-1902	2,508,823	32	1.3
1903-1912	2,976,065	38	1.3
Ages 30–39			
1881-1890	1,394,740	177	12.7
1891-1902	1,939,360	193	10.0
1903-1912	2,481,095	227	9.1
Ages 40–49			
1881-1890	1,008,630	341	33.8
1891-1902	1,412,790	395	28.0
1903-1912	1,844,770	563	30.5
Ages 50–59			
1881-1890	672,701	327	48.6
1891-1902	888,693	441	49.6
1903-1912	1,150,485	617	53.6
Ages 60 and Over			
1881-1890	624,080	281	45.0
1891-1902	796,733	390	48.9
1903-1912	977,620	602	61.6

Source: Annual Reports of the Bureau of Health of the City of Philadelphia, Pa.

*1897 and 1898 not available.

APPENDIX F (PART II)

Table 135
Mortality from Cancer of the Breast in Philadelphia, Pa. according to Age, 1881-1912

	Population	Deaths from Cancer	Rate per 100,000 Population	Years	Population	Deaths from Cancer	Rate per 100,000 Population
	Ages Under 20				Ages 40–49		
0	3,929,590	3	0.1	1881-1890	1,008,630	142	14.1
2*	4,450,560	2	0.0	1891-1902	1,412,790	185	13.1
2	5,394,240	1	0.0	1903-1912	1,844,770	276	15.0
	Ages 20–29				Ages 50–59		
0	1,929,053	..	0.0	1881-1890	672,701	154	22.9
2	2,508,823	6	0.2	1891-1902	888,693	255	28.7
2	2,976,065	9	0.3	1903-1912	1,150,485	335	29.1
	Ages 30–39				Ages 60 and Over		
0	1,394,740	57	4.1	1881-1890	624,080	262	42.0
2	1,939,360	78	4.0	1891-1902	796,733	313	39.3
2	2,481,095	108	4.4	1903-1912	977,620	563	57.6

Source: Annual Reports of the Bureau of Health of the City of Philadelphia, Pa.

*1897 and 1898 not available.

Table 136
Mortality from Cancer of the Skin in Philadelphia, Pa. according to Age, 1881-1912

	Population	Deaths from Cancer	Rate per 100,000 Population	Years	Population	Deaths from Cancer	Rate per 100,000 Population
	Ages Under 20				Ages 40–49		
0	3,929,590	4	0.1	1881-1890	1,008,630	10	1.0
2*	4,450,560	4	0.1	1891-1902	1,412,790	27	1.9
2	5,394,240	8	0.1	1903-1912	1,844,770	61	3.3
	Ages 20–29				Ages 50–59		
0	1,929,053	2	0.1	1881-1890	672,701	19	2.8
2	2,508,823	..	..	1891-1902	888,693	48	5.5
2	2,976,065	7	0.2	1903-1912	1,150,485	105	9.1
	Ages 30–39				Ages 60 and Over		
0	1,394,740	4	0.3	1881-1890	624,080	88	14.1
2	1,939,360	10	0.5	1891-1902	796,733	144	18.1
2	2,481,095	18	0.7	1903-1912	977,620	320	32.7

Source: Annual Reports of the Bureau of Health of the City of Philadelphia, Pa.

*1897 and 1898 not available.

APPENDIX F (PART II)

Table 137
Mortality from Cancer of Other or Not Specified Organs in Philadelphia, Pa. according to Age, 1881-1912

Years	Population	Deaths from Cancer	Rate per 100,000 Population
Ages Under 20			
1881-1890	3,929,590	20	0.5
1891-1902*	4,450,560	32	0.7
1903-1912	5,394,240	104	1.9
Ages 20–29			
1881-1890	1,929,053	17	0.9
1891-1902	2,508,823	13	0.5
1903-1912	2,976,065	71	2.4
Ages 30–39			
1881-1890	1,394,740	47	3.4
1891-1902	1,939,360	91	4.7
1903-1912	2,481,095	154	6.2
Ages 40–49			
1881-1890	1,008,630	83	8.3
1891-1902	1,412,790	157	11.1
1903-1912	1,344,770	348	18.9
Ages 50–59			
1881-1890	672,701	120	17.8
1891-1902	888,693	194	21.8
1903-1912	1,150,485	446	38.8
Ages 60 and Over			
1881-1890	624,080	231	37.0
1891-1902	796,733	348	43.7
1903-1912	977,620	854	87.4

Source: Annual Reports of the Bureau of Health of the City of Philadelphia, Pa.

*1897 and 1898 not available.

Table 138
Mortality from Cancer in Philadelphia, Pa. according to Age, 1881-1912

Years	Population	Deaths from Cancer	Rate per 100,000 Population
Ages Under 20			
1881-1890	3,929,590	51	1.3
1891-1902*	4,450,560	58	1.3
1903-1912	5,394,240	165	3.1
Ages 20–29			
1881-1890	1,929,053	89	4.6
1891-1902	2,508,823	109	4.3
1903-1912	2,976,065	211	7.1
Ages 30–39			
1881-1890	1,394,740	454	32.6
1891-1902	1,939,360	638	32.9
1903-1912	2,481,095	868	35.0
Ages 40–49			
1881-1890	1,008,630	966	95.8
1891-1902	1,412,790	1,388	98.2
1903-1912	1,844,770	2,266	122.8
Ages 50–59			
1881-1890	672,701	1,210	179.9
1891-1902	888,693	1,901	213.9
1903-1912	1,150,485	3,189	277.2
Ages 60 and Over			
1881-1890	624,080	1,919	307.5
1891-1902	796,733	2,832	355.5
1903-1912	977,620	5,239	535.9

Source: Annual Reports of the Bureau of Health of the City of Philadelphia, Pa.

*1897 and 1898 not available.

APPENDIX F (PART II)

Table 139
Mortality from Cancer in Pittsburgh, Pa.
1888-1913

	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
	222,019	79	35.6	1901	327,468	147	44.9
	230,318	79	34.3	1902	333,320	185	55.5
	238,617	93	39.0	1903	339,172	197	58.1
				1904	345,024	179	51.9
	246,916	82	33.2	1905	350,870	200	57.0
	255,216	87	34.1				
	263,516	116	44.0	1901-1905	1,695,860	908	53.5
	271,816	137	50.4				
	280,116	112	40.0	1906	356,728	244	68.4
				1907	362,581	239	65.9
95	1,317,580	534	40.5	1908	517,425	323	62.4
				1909	525,665	367	69.8
	288,416	129	44.7	1910	533,905	351	65.7
	296,716	138	46.5				
	305,016	113	37.0	1906-1910	2,296,304	1,524	66.4
	313,316	132	42.1				
	321,616	167	51.9	1911	542,145	371	68.4
				1912	550,385	368	66.9
00	1,525,080	679	44.5	1913	558,625	348	62.3

Source: 1888-1899 and 1910-1913, Annual Reports of the Department of Public Health of the City of Pittsburgh, Pa., 1900-1909, United States Mortality Statistics.

Table 140
Mortality from Cancer in Pittsburgh, Pa., Males
1888-1899 and 1910-1913

	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
	116,187	26	22.4	1896	149,158	40	26.8
	120,308	23	19.1	1897	153,280	56	36.5
	124,429	28	22.5	1898	157,402	42	26.7
				1899	161,524	45	27.9
	128,550	33	25.7				
	132,671	39	29.4	1896-1899	621,364	183	29.5
	136,792	47	34.4				
	140,914	53	37.6	1910	273,589	140	51.2
	145,036	39	26.9	1911	277,717	143	51.5
				1912	281,845	161	57.1
95	683,963	211	30.8	1913	285,973	143	50.0
				1910-1913	1,119,124	587	52.5

Source: Annual Reports of the Department of Public Health of the City of Pittsburgh, Pa.

APPENDIX F (PART II)

Table 141
Mortality from Cancer in Pittsburgh, Pa., Females
1888-1899 and 1910-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1888	105,832	53	50.1
1889	110,010	56	50.9
1890	114,188	65	56.9
1891	118,366	49	41.4
1892	122,545	48	39.2
1893	126,724	69	54.4
1894	130,902	84	64.2
1895	135,080	73	54.0
1891-1895	633,617	323	51.0

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1896	139,258	89	63.9
1897	143,436	82	57.2
1898	147,614	71	48.1
1899	151,792	87	57.3
1896-1899	582,100	329	56.5
1910	260,316	211	81.1
1911	264,428	228	86.2
1912	268,540	207	77.1
1913	272,652	205	75.2
1910-1913	1,065,936	851	79.8

Source: Annual Reports of the Department of Public Health of the City of Pittsburgh, Pa.

Table 142
Mortality from Cancer in Pittsburgh, Pa., according to Age
1893-1902 Compared with 1903-1912

	1893-1902			1903-1912			
Ages	Population	Deaths from Cancer	Rate per 100,000 Population	Population	Deaths from Cancer	Rate per 100,000 Population	Percentage of Increase
Under 20.....	1,241,832	21	1.7	1,715,100	38	2.2	29.4
20–29........	653,622	56	8.6	922,635	76	8.2	−4.7
30–39........	470,309	153	32.5	748,980	260	34.7	6.8
40–49........	319,236	313	98.0	511,565	573	112.0	14.3
50–59........	179,958	371	206.2	295,010	756	256.3	24.3
60 and over...	132,615	462	348.4	221,383	1,136	513.1	47.3
All Ages......	2,997,572	1,376	45.9	4,414,673	2,839	64.3	40.1

Source: Annual Reports of the Department of Public Health of the City of Pittsburgh, Pa.

APPENDIX F (PART II)

Table 143
Mortality from Cancer in Pittsburgh, Pa., by Organs and Parts according to Age, 1888-1899

	All Organs	Œsophagus Stomach Liver	Intestines Rectum	Female Generative Organs	Breast	All Other Organs
	Deaths from Cancer					
30...............	79	15	10	8	4	42
....	152	46	17	43	11	35
....	300	102	24	89	25	60
....	320	138	28	55	29	70
over.............	446	219	31	65	27	104
s.................	1,297	520	110	260	96	311
	Rate per 100,000 Population					
30...............	3.8	0.7	0.5	0.4	0.2	2.0
....	31.2	9.4	3.5	8.8	2.3	7.2
....	91.0	30.9	7.3	27.0	7.6	18.2
....	170.6	73.5	14.9	29.3	15.5	37.3
over.............	320.5	157.4	22.2	46.7	19.4	74.7
s.................	40.4	16.2	3.5	8.1	3.0	9.6

rce: Annual Reports of the Department of Public Health of the City of rgh, Pa.

Table 144
Mortality from Cancer in Pittsburgh, Pa., by Organs and Parts according to Sex, 1888-1899

Organ or Part	TOTAL Deaths from Cancer	TOTAL Rate per 100,000 Population	MALES Deaths from Cancer	MALES Rate per 100,000 Population	FEMALES Deaths from Cancer	FEMALES Rate per 100,000 Population
cavity...............	27	0.8	22	1.3	5	0.3
agus..................	18	0.6	12	0.7	6	0.4
h...................	354	11.0	178	10.7	176	11.4
....	148	4.6	66	4.0	82	5.3
n.....................	50	1.6	18	1.1	32	2.1
ntestines.............	60	1.9	18	1.1	42	2.7
y organs..............	30	0.9	17	1.0	13	0.8
generative organs.....	260	8.1	..	..	260	16.8
....	96	3.0	..	..	96	6.2
....	33	1.0	20	1.2	13	0.8
....	17	0.5	8	0.5	9	0.6
organs...............	74	2.3	52	3.1	22	1.4
ecified................	130	4.1	60	3.6	70	4.6
ans..................	1,297	40.4	471	28.3	826	53.4

rce: Annual Reports of the Department of Public Health of the City of rgh, Pa.

APPENDIX F (PART II)

Table 145

Mortality from Cancer in Pittsburgh, Pa., by Organs and Parts according to Sex, 1910-1913

Organ or Part	TOTAL Deaths from Cancer	TOTAL Rate per 100,000 Population	MALES Deaths from Cancer	MALES Rate per 100,000 Population	FEMALES Deaths from Cancer	FEMALES Rate per 100,000 Population
Buccal cavity	35	1.6	32	2.9	3	0.3
Stomach and liver	541	24.8	258	23.1	283	26.5
Peritoneum, intestines, rectum	151	6.9	64	5.7	87	8.2
Female generative organs	244	11.2	..	..	244	22.9
Breast	86	3.9	..	..	86	8.1
Skin	35	1.6	17	1.4	18	1.7
Other or not specified organs	201	9.2	140	12.6	61	5.7
All organs	1,293	59.2	511	45.7	782	73.4

Source: Annual Reports of the Department of Public Health, City of Pittsburgh, Pa., 1910, 1911; Annual Reports, Bureau of Infectious Diseases, City of Pittsburgh, Pa., 1912, 1913. Deaths of non-residents are excluded.

Table 146

Increase in the Mortality from Cancer in Pittsburgh, Pa., by Organs and Parts, according to Sex, 1888-1899 Compared with 1910-1913

Organ or Part	Rate per 100,000 Population 1888-1899	Rate per 100,000 Population 1910-1913	Percentage of Increase
TOTAL			
Buccal cavity	0.8	1.6	100.0
Stomach and liver	16.2	24.8	53.1
Peritoneum, intestines and rectum	3.5	6.9	97.1
Generative organs	8.1	11.2	38.3
Breast	3.0	3.9	30.0
Skin	1.0	1.6	60.0
Other or not specified organs	7.8	9.2	17.9
All organs	40.4	59.2	46.5
MALES			
Buccal cavity	1.3	2.9	123.1
Stomach and liver	15.4	23.1	50.0
Peritoneum, intestines and rectum	2.2	5.7	159.1
Skin	1.2	1.4	16.7
Other or not specified organs	8.2	12.6	53.7
All organs	28.3	45.7	61.5
FEMALES			
Buccal cavity	0.3	0.3	0.0
Stomach and liver	17.1	26.5	55.0
Peritoneum, intestines and rectum	4.8	8.2	70.8
Generative organs	16.8	22.9	36.3
Breast	6.2	8.1	30.6
Skin	0.8	1.7	112.5
Other or not specified organs	7.4	5.7	—23.0
All organs	53.4	73.4	37.5

Source: Annual Reports of the Department of Public Health of the City of Pittsburgh, Pa.

APPENDIX F (PART II)

Table 147
Mortality from Cancer in Providence, R. I.
1881-1914

	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
	107,499	65	60.5	1901	180,204	143	79.4
	110,141	52	47.2	1902	184,811	156	84.4
	112,784	84	74.5	1903	189,419	151	79.7
	115,427	70	60.6	1904	194,027	185	95.3
	118,070	88	74.5	1905	198,635	189	95.1
85	563,921	359	63.7	1901-1905	947,096	824	87.0
	120,885	87	72.0	1906	203,773	186	91.3
	123,700	76	61.4	1907	208,911	222	106.3
	126,515	87	68.8	1908	214,049	187	87.4
	129,330	77	59.5	1909	219,187	217	99.0
	132,146	72	54.5	1910	224,326	225	100.3
90	632,576	399	63.1	1906-1910	1,070,246	1,037	96.9
	134,811	81	60.1	1911	229,464	221	96.3
	137,476	77	56.0	1912	234,602	248	105.7
	140,141	95	67.8	1913	239,740	253	105.5
	142,806	78	54.6	1914	244,878	225	91.9
	145,472	96	66.0				
95	700,706	427	60.9				
	151,497	89	58.7				
	157,522	101	64.1				
	163,547	120	73.4				
	169,572	132	77.8				
	175,597	133	75.7				
00	817,735	575	70.3				

Source: Annual Reports on Births, Marriages and Deaths of the City of Providence, R. I.

APPENDIX F (PART II)

Table 148
Mortality from Cancer in Providence, R. I., Males
1881-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	51,116	18	35.2
1882	52,449	14	26.7
1883	53,787	26	48.3
1884	55,116	19	34.5
1885	56,449	15	26.6
1881-1885	268,917	92	34.2
1886	57,868	28	48.4
1887	59,289	19	32.0
1888	60,715	28	46.1
1889	62,143	20	32.2
1890	63,575	15	23.6
1886-1890	303,590	110	36.2
1891	64,898	21	32.4
1892	66,222	21	31.7
1893	67,548	16	23.7
1894	68,875	31	45.0
1895	70,205	28	39.9
1891-1895	337,748	117	34.6
1896	73,158	25	34.2
1897	76,130	31	40.7
1898	79,108	31	39.2
1899	82,090	43	52.4
1900	85,077	46	54.1
1896-1900	395,563	176	44.5
1901	87,435	42	48.0
1902	89,800	51	56.8
1903	92,171	46	49.9
1904	94,549	56	59.2
1905	96,934	68	70.2
1901-1905	460,889	263	57.1
1906	99,584	52	52.2
1907	102,241	67	65.5
1908	104,905	67	63.9
1909	107,577	75	69.7
1910	110,279	73	66.2
1906-1910	524,586	334	63.7
1911	112,988	78	69.0
1912	115,706	89	76.9
1913	118,426	83	70.1
1914	121,156	82	67.7

Source: Annual Reports on Births, Marriages and Deaths of the City of Providence, R. I.

Table 149
Mortality from Cancer in Providence, R. I., Females 1881-1914

	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
	56,383	47	83.4	1901	92,769	101	108.9
	57,692	38	65.9	1902	95,011	105	110.5
	58,997	58	98.3	1903	97,248	105	108.0
	60,311	51	84.6	1904	99,478	129	129.7
	61,621	73	118.5	1905	101,701	121	119.0
5	295,004	267	90.5	1901-1905	486,207	561	115.4
	63,017	59	93.6	1906	104,189	134	128.6
	64,411	57	88.5	1907	106,670	155	145.3
	65,800	59	89.7	1908	109,144	120	109.9
	67,187	57	84.8	1909	111,610	142	127.2
	68,571	57	83.1	1910	114,047	152	133.3
0	328,986	289	87.8	1906-1910	545,660	703	128.8
	69,913	60	85.8	1911	116,476	143	122.8
	71,254	56	78.6	1912	118,896	159	133.7
	72,593	79	108.8	1913	121,314	170	140.1
	73,931	47	63.6	1914	123,722	143	115.6
	75,267	68	90.3				
5	362,958	310	85.4				
	78,339	64	81.7				
	81,392	70	86.0				
	84,439	89	105.4				
	87,482	89	101.7				
	90,520	87	96.1				
0	422,172	399	94.5				

Source: Annual Reports on Births, Marriages and Deaths of the City of Providence, R. I.

Table 150
[ortality from Cancer in Providence, R. I., by Organs and Parts according to Sex, 1903-1912

Organ or Part	TOTAL Deaths from Cancer	TOTAL Rate per 100,000 Population	MALES Deaths from Cancer	MALES Rate per 100,000 Population	FEMALES Deaths from Cancer	FEMALES Rate per 100,000 Population
avity...............	70	3.3	57	5.5	13	1.2
and liver...........	640	30.2	297	28.6	343	31.7
um, intestines, rectum	328	15.5	131	12.6	197	18.2
;enerative organs.....	393	18.5	..	..	393	36.3
....	257	12.1	5	0.5	252	23.3
....	54	2.5	30	2.9	24	2.2
not specified organs ..	289	13.6	151	14.4	138	12.8
ıs..................	2,031	95.7	671	64.5	1,360	125.7

:e: Annual Reports on Births, Marriages and Deaths of the City of Providence,

APPENDIX F (PART II)

Table 151
Mortality from Cancer in Richmond, Va.
1879-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1879	62,343	19	30.5
1880	63,600	19	29.9
1882	67,156	21	31.3
1883	68,935	29	42.1
1884	70,714	22	31.1
1882-1884	206,805	72	34.8
1886	74,272	26	35.0
1887	76,051	21	27.6
1888	..	..	..
1889	79,609	37	46.5
1890	81,388	36	44.2
1886-1890	311,320	120	38.5
1891	81,754	26	31.8
1892	82,120	23	28.0
1893	82,486	32	38.8
1894	82,852	29	35.0
1895	83,218	24	28.8
1891-1895	412,430	134	32.5
1896	83,584	35	41.9
1897	83,950	36	42.9
1898	84,316	21	24.9
1899	84,683	30	35.4
1900	85,050	39	45.9
1896-1900	421,583	161	38.2
1901	89,307	47	52.6
1902	93,564	26	27.8
1903	97,822	50	51.1
1904	102,080	52	50.9
1905	106,338	45	42.3
1901-1905	489,111	220	45.0
1906	110,596	75	67.8
1907	114,854	80	69.7
1908	119,112	84	70.5
1909	123,370	92	74.6
1910	127,628	109	85.4
1906-1910	595,560	440	73.9
1911	131,886	113	85.7
1912	136,144	120	88.1
1913	140,402	115	81.9
1914	144,658	125	86.4

Source: Annual Reports of the Health Department of the City of Richmond, Va.

Table 152

ty from Cancer in Richmond, Va., Males, 1882-1913

	Population	Deaths from Cancer	Rate per 100,000 Population
	31,598	4	12.7
	32,431	6	18.5
	33,265	6	18.0
4	97,294	16	16.4
	34,931	5	14.3
	35,764	8	22.4
	..	..	..
	37,429	9	24.0
	38,261	14	36.6
0	146,385	36	24.6
	38,428	12	31.2
	38,595	9	23.3
	38,762	6	15.5
	38,929	5	12.8
	39,096	5	12.8
5	193,810	37	19.1
	39,264	14	35.7
	39,432	16	40.6
	39,600	8	20.2
	39,768	9	22.6
	39,936	15	37.6
0	198,000	62	31.3
	42,032	13	30.9
	44,129	4	9.1
	46,226	8	17.3
	48,323	13	26.9
	50,420	18	35.7
5	231,130	56	24.2
	52,517	24	45.7
	54,614	30	54.9
	56,711	28	49.4
	58,808	31	52.7
	60,905	39	64.0
0	283,555	152	53.6
	63,002	32	50.8
	65,099	42	64.5
	67,196	42	62.5

:: Annual Reports of the Health ent of the City of Richmond, Va.

Table 153

Mortality from Cancer in Richmond, Va., Females, 1882-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1882	35,558	17	47.8
1883	36,504	23	63.0
1884	37,449	16	42.7
1882-1884	109,511	56	51.1
1886	39,341	21	53.4
1887	40,287	13	32.3
1888	..	..	..
1889	42,180	28	66.4
1890	43,127	22	51.0
1886-1890	164,935	84	50.9
1891	43,326	14	32.3
1892	43,525	14	32.2
1893	43,724	26	59.5
1894	43,923	24	54.6
1895	44,122	19	43.1
1891-1895	218,620	97	44.4
1896	44,320	21	47.4
1897	44,518	20	44.9
1898	44,716	13	29.1
1899	44,915	21	46.8
1900	45,114	24	53.2
1896-1900	223,583	99	44.3
1901	47,275	34	71.9
1902	49,435	22	44.5
1903	51,596	42	81.4
1904	53,757	39	72.5
1905	55,918	27	48.3
1901-1905	257,981	164	63.6
1906	58,079	51	87.8
1907	60,240	50	83.0
1908	62,401	56	89.7
1909	64,562	61	94.5
1910	66,723	70	104.9
1906-1910	312,005	288	92.3
1911	68,884	81	117.6
1912	71,045	78	109.8
1913	73,206	73	99.7

Source: Annual Reports of the Health Department of the City of Richmond, Va.

Table 154
Mortality from Cancer in Richmond, Va., White, 1879-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1879	34,981	12	34.3
1880	35,765	14	39.1
1882	38,418	13	33.8
1883	39,745	16	40.3
1884	41,072	13	31.7
1882-1884	119,235	42	35.2
1886	43,726	16	36.6
1887	45,053	18	40.0
1888	..	..	..
1889	47,707	23	48.2
1890	49,034	23	46.9
1886-1890	185,520	80	43.1
1891	49,410	19	38.5
1892	49,786	15	30.1
1893	50,162	26	51.8
1894	50,538	18	35.6
1895	50,914	19	37.3
1891-1895	250,810	97	38.7
1896	51,290	28	54.6
1897	51,667	28	54.2
1898	52,044	10	19.2
1899	52,421	24	45.8
1900	52,798	26	49.2
1896-1900	260,220	116	44.6
1901	55,606	28	50.4
1902	58,414	19	32.5
1903	61,222	32	52.3
1904	64,030	31	48.4
1905	66,838	30	44.9
1901-1905	306,110	140	45.7
1906	69,646	53	76.1
1907	72,454	51	70.4
1908	75,262	62	82.4
1909	78,070	66	84.5
1910	80,879	83	102.6
1906-1910	376,311	315	83.7
1911	83,687	80	95.6
1912	86,495	88	101.7
1913	89,306	81	90.7
1914	92,117	89	96.6

Source: Annual Reports of the Health Department of the City of Richmond, Va.

Table 155
Mortality from Cancer in Richmond, Va., Colored, 1879-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1879	27,362	7	25.6
1880	27,835	5	18.0
1882	28,738	8	27.8
1883	29,190	13	44.5
1884	29,642	9	30.4
1882-1884	87,570	30	34.3
1886	30,546	10	32.7
1887	30,998	3	9.7
1888	..	..	..
1889	31,902	14	43.9
1890	32,354	13	40.2
1886-1890	125,800	40	31.8
1891	32,344	7	21.6
1892	32,334	8	24.7
1893	32,324	6	18.6
1894	32,314	11	34.0
1895	32,304	5	15.5
1891-1895	161,620	37	22.9
1896	32,294	7	21.7
1897	32,283	8	24.8
1898	32,272	11	34.1
1899	32,262	6	18.6
1900	32,252	13	40.3
1896-1900	161,363	45	27.9
1901	33,701	19	56.4
1902	35,150	7	19.9
1903	36,600	18	49.2
1904	38,050	21	55.2
1905	39,500	15	38.0
1901-1905	183,001	80	43.7
1906	40,950	22	53.7
1907	42,400	29	68.4
1908	43,850	22	50.2
1909	45,300	26	57.4
1910	46,749	26	55.6
1906-1910	219,249	125	57.0
1911	48,199	33	68.5
1912	49,649	32	64.5
1913	51,096	34	66.5
1914	52,541	36	68.5

Source: Annual Reports of the Health Department of the City of Richmond, Va.

APPENDIX F (PART II)

Table 156

Mortality from Cancer in Richmond, Va., by Organs and Parts according to Sex, 1903-1912

Organ or Part	TOTAL Deaths from Cancer	TOTAL Rate per 100,000 Population	MALES Deaths from Cancer	MALES Rate per 100,000 Population	FEMALES Deaths from Cancer	FEMALES Rate per 100,000 Population
Buccal cavity	40	3.4	30	5.4	10	1.6
Stomach and liver	218	18.6	88	15.8	130	21.2
Peritoneum, intestines, rectum	81	6.9	34	6.1	47	7.7
Female generative organs	211	18.0	..	..	211	34.4
Breast	85	7.3	..	..	85	13.9
Skin	14	1.2	11	2.0	3	0.5
Other or not specified organs	171	14.7	102	18.3	69	11.2
All organs	820	70.1	265	47.6	555	90.5

Source: Annual Reports of the Health Department of the City of Richmond, Va.

Table 157

Mortality from Cancer in Rochester, N. Y. 1891-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	139,365	89	63.9
1892	144,834	75	51.8
1893	147,055	77	52.4
1894	149,276	102	68.3
1895	151,498	99	65.3
1891-1895	732,028	442	60.4
1896	153,720	103	67.0
1897	155,942	124	79.5
1898	158,164	110	69.5
1899	160,386	115	71.7
1900	162,608	102	62.7
1896-1900	790,820	554	70.1
1901	166,419	154	92.5
1902	170,230	157	92.2
1903	174,042	138	79.3
1904	177,854	156	87.7
1905	181,666	164	90.3
1901-1905	870,211	769	88.4
1906	188,962	170	90.0
1907	196,258	165	84.1
1908	203,555	175	86.0
1909	210,852	179	84.9
1910	218,149	209	95.8
1906-1910	1,017,776	898	88.2
1911	225,445	207	91.8
1912	232,741	226	97.1
1913	240,037	227	94.6

Source: 1891-1894, Monthly Reports of the State Board of Health of New York; 1895-1913, Annual Reports of the Health Bureau of the City of Rochester, N. Y.

Table 158
Mortality from Cancer in Rochester, N. Y., by Sex, 1900-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
MALES			
1900	77,520	34	43.9
1901	79,699	45	56.5
1902	81,878	56	68.4
1903	84,057	55	65.4
1904	86,237	61	70.7
1905	88,417	56	63.3
1901-1905	420,288	273	65.0
1906	92,404	63	68.2
1907	96,391	56	58.1
1908	100,378	60	59.8
1909	104,365	62	59.4
1910	108,352	91	84.0
1906-1910	501,890	332	66.1
1911	112,339	75	66.8
1912	116,326	68	58.5
1913	120,313	86	71.5
FEMALES			
1900	85,088	68	79.9
1901	86,720	109	125.7
1902	88,352	101	114.3
1903	89,985	83	92.2
1904	91,617	95	103.7
1905	93,249	108	115.8
1901-1905	449,923	496	110.2
1906	96,558	107	110.8
1907	99,867	109	109.1
1908	103,177	115	111.5
1909	106,487	117	109.9
1910	109,797	118	107.5
1906-1910	515,886	566	109.7
1911	113,106	132	116.7
1912	116,415	158	135.7
1913	119,724	141	117.8

Source: 1891-1894, Monthly Reports of the State Board of Health of New York; 1895-1913, Annual Reports of the Health Bureau of the City of Rochester, N. Y.

Table 159
Mortality from Cancer in San Francisco, Cal., 1884-1913

Year (Ending June 30)	Population	Deaths from Cancer	Rate per 100,000 Population
1884	259,973	166	63.9
1885	266,477	136	51.0
1886	272,981	180	65.9
1887	279,485	184	65.8
1888	285,989	190	66.4
1889	292,493	198	67.7
1890	298,997	216	72.2
1886-1890	1,429,945	968	67.7
1891	303,375	227	74.8
1892	307,753	243	79.0
1893	312,131	210	67.3
1894	316,509	239	75.5
1895	320,887	291	90.7
1891-1895	1,560,655	1,210	77.5
1896	325,266	322	99.0
1897	329,645	344	104.4
1898	334,024	373	111.7
1899	338,403	353	104.3
1900	342,782	400	116.7
1896-1900	1,670,120	1,792	107.3
1901	350,195	398	113.7
1902	357,608	387	108.2
1903	365,021	415	113.7
1904*	372,434	484	130.0
1905*	379,847	456	120.0
1901-1905	1,825,105	2,140	117.3
1906*	387,260	367	94.8
1907	394,673	357	90.5
1908	402,086	445	110.7
1909	409,499	418	102.1
1910	416,912	473	113.5
1906-1910	2,010,430	2,060	102.5
1911	424,325	466	109.8
1912	431,738	486	112.6
1913	439,151	555	126.4

Source: Annual Reports of the Department of Public Health of the City of San Francisco, Cal.

*Calendar Years, Data from United States Mortality Statistics.

APPENDIX F (PART II)

Table 160
Mortality from Cancer in San Francisco, Cal., Males
1884-1913

Year (Ending June 30)	Population	Deaths from Cancer	Rate per 100,000 Population
1884	148,355	69	46.5
1885	151,929	71	46.7
1886	155,503	79	50.8
1887	159,077	75	47.1
1888	162,651	101	62.1
1889	166,225	89	53.5
1890	169,800	109	64.2
1886-1890	813,256	453	55.7
1891	171,306	93	54.3
1892	172,812	114	66.0
1893	174,318	102	58.5
1894	175,824	117	66.5
1895	177,331	148	83.5
1891-1895	871,591	574	65.9
1896	178,838	170	95.1
1897	180,345	187	103.7
1898	181,852	182	100.1
1899	183,359	186	101.4
1900	184,866	210	113.6
1896-1900	909,260	935	102.8
1901	190,069	192	101.0
1902	195,272	172	88.1
1903	200,475	205	102.3
1901-1903	585,816	569	97.1
1907	221,289	183	82.7
1908	226,493	234	103.3
1909	231,697	212	91.5
1910	236,901	236	99.6
1907-1910	916,380	865	94.4
1911	242,105	247	102.0
1912	247,309	254	102.7
1913	252,513	286	113.3

Source: Annual Reports of the Department of Public Health of the City of San Francisco, Cal.

APPENDIX F (PART II)

Table 161
Mortality from Cancer in San Francisco, Cal., Females
1884-1913

Year (Ending June 30)	Population	Deaths from Cancer	Rate per 100,000 Population
1884	111,618	97	86.9
1885	114,548	65	56.7
1886	117,478	101	86.0
1887	120,408	109	90.5
1888	123,338	89	72.2
1889	126,268	109	86.3
1890	129,197	107	82.8
1886-1890	616,689	515	83.5
1891	132,069	134	101.5
1892	134,941	129	95.6
1893	137,813	108	78.4
1894	140,685	122	86.7
1895	143,556	143	99.6
1891-1895	689,064	636	92.3
1896	146,428	152	103.8
1897	149,300	157	105.2
1898	152,172	191	125.5
1899	155,044	167	107.7
1900	157,916	190	120.3
1896-1900	760,860	857	112.6
1901	160,126	206	128.6
1902	162,336	215	132.4
1903	164,546	210	127.6
1901-1903	487,008	631	129.6
1907	173,384	174	100.4
1908	175,593	211	120.2
1909	177,802	206	115.9
1910	180,011	237	131.7
1907-1910	706,790	828	117.1
1911	182,220	219	120.2
1912	184,429	232	125.8
1913	186,638	269	144.1

Source: Annual Reports of the Department of Public Health of the City of San Francisco, Cal.

Table 162
Mortality from Cancer in San Francisco, Cal., by Organs and Parts according to Sex, July 1, 1906, to June 30, 1913

Organ or Part	TOTAL Deaths from Cancer	TOTAL Rate per 100,000 Population	MALES Deaths from Cancer	MALES Rate per 100,000 Population	FEMALES Deaths from Cancer	FEMALES Rate per 100,000 Population
Buccal cavity	186	6.5	172	10.6	14	1.1
Stomach and liver	1,377	48.0	878	54.1	499	40.1
Peritoneum, intestines, rectum	442	15.4	223	13.7	219	17.6
Female generative organs	406	14.2	..	..	406	32.6
Breast	253	8.8	1	0.1	252	20.2
Skin	67	2.3	41	2.5	26	2.1
Other or not specified organs	468	16.4	336	20.8	132	10.6
All organs	3,199	111.6	1,651	101.8	1,548	124.3

Source: Annual Reports of the Department of Public Health of the City of San Francisco, Cal.

APPENDIX F (PART II)

Table 163
Mortality from Cancer in San Francisco, Cal., by Age according to Sex, July 1, 1906, to June 30, 1911

	MALES			FEMALES		
s	Population	Deaths from Cancer	Rate per 100,000 Population	Population	Deaths from Cancer	Rate per 100,000 Population
20	281,185	5	1.8	273,025	2	0.7
	268,150	25	9.3	199,150	16	8.0
	247,825	69	27.8	166,770	119	71.4
	168,026	207	123.2	112,899	233	206.4
	98,620	300	304.2	69,675	276	396.1
over	77,285	503	650.8	64,985	400	615.5
wn	17,394	3	..	2,506	1	..
s	1,158,485	1,112	96.0	889,010	1,047	117.8

rce: Annual Reports of the Department of Public Health of the City of San sco, Cal.

Table 164
Mortality from Cancer in Savannah, Ga.
1881-1914

	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
l	31,957	15	46.9	1901	55,326	17	30.7
2	33,205	13	39.2	1902	56,408	33	58.5
3	34,453	7	20.3	1903	57,490	19	33.0
4	35,701	15	42.0	1904	58,572	36	61.5
5	36,949	14	37.9	1905	59,654	40	67.1
885	172,265	64	37.2	1901-1905	287,450	145	50.4
5	38,197	14	36.7	1906	60,736	27	44.5
7	39,445	22	55.8	1907	61,818	36	58.2
3	40,693	10	24.6	1908	62,900	29	46.1
)	41,941	10	23.8	1909	63,982	33	51.6
)	43,189	19	44.0	1910	65,064	23	35.3
890	203,465	75	36.9	1906-1910	314,500	148	47.1
l	44,294	16	36.1	1911	66,146	45	68.0
2	45,399	12	26.4	1912	67,228	52	77.3
3	46,504	22	47.3	1913	68,310	43	62.9
4	47,609	10	21.0	1914	69,392	42	60.5
5	48,714	19	39.0				
895	232,520	79	34.0				
3	49,820	20	40.1				
7	50,926	17	33.4				
3	52,032	25	48.0				
)	53,138	20	37.6				
)	54,244	22	40.6				
900	260,160	104	40.0				

Source: Annual Municipal Reports of the City of Savannah, Ga.

APPENDIX F (PART II)

Table 165
Mortality from Cancer in Savannah, Ga., White
1881-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	15,558	9	57.8
1882	16,075	10	62.2
1883	16,592	4	24.1
1884	17,109	9	52.6
1885	17,626	9	51.1
1881-1885	82,960	41	49.4
1886	18,143	11	60.6
1887	18,660	13	69.7
1888	19,177	8	41.7
1889	19,694	8	40.6
1890	20,211	9	44.5
1886-1890	95,885	49	51.1
1891	20,800	10	48.1
1892	21,389	6	28.1
1893	21,979	8	36.4
1894	22,569	5	22.2
1895	23,159	9	38.9
1891-1895	109,896	38	34.6
1896	23,749	14	58.9
1897	24,339	14	57.5
1898	24,929	21	84.2
1899	25,519	16	62.7
1900	26,109	15	57.5
1896-1900	124,645	80	64.2
1901	26,676	16	60.0
1902	27,243	24	88.1
1903	27,810	15	53.9
1904	28,377	22	77.5
1905	28,944	24	82.9
1901-1905	139,050	101	72.6
1906	29,512	21	71.2
1907	30,080	25	83.1
1908	30,648	20	65.3
1909	31,216	25	80.1
1910	31,784	17	53.5
1906-1910	153,240	108	70.5
1911	32,351	29	89.6
1912	32,918	28	85.1
1913	33,485	24	71.7
1914	34,052	32	94.0

Source: Annual Municipal Reports of the City of Savannah, Ga.

Table 166
Mortality from Cancer in Savannah, Ga., Colored
1881-1914

	Population	Deaths from Cancer	Rate per 100,000 Population
	16,399	6	36.6
	17,130	3	17.5
	17,861	3	16.8
	18,592	6	32.3
	19,323	5	25.9
5	89,305	23	25.8
	20,054	3	15.0
	20,785	9	43.3
	21,516	2	9.3
	22,247	2	9.0
	22,978	10	43.5
)	107,580	26	24.2
	23,494	6	25.5
	24,010	6	25.0
	24,525	14	57.1
	25,040	5	20.0
	25,555	10	39.1
5	122,624	41	33.4
	26,071	6	23.0
	26,587	3	11.3
	27,103	4	14.8
	27,619	4	14.5
	28,135	7	24.9
)	135,515	24	17.7

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	28,650	1	3.5
1902	29,165	9	30.9
1903	29,680	4	13.5
1904	30,195	14	46.4
1905	30,710	16	52.1
1901-1905	148,400	44	29.6
1906	31,224	6	19.2
1907	31,738	11	34.7
1908	32,252	9	27.9
1909	32,766	8	24.4
1910	33,280	6	18.0
1906-1910	161,260	40	24.8
1911	33,795	16	47.3
1912	34,310	24	70.0
1913	34,825	19	54.6
1914	35,340	10	28.3

Source: Annual Municipal Reports of the City of Savannah, Ga.

Table 167
Mortality from Cancer in Seattle, Wash.
1899-1914

	Population	Deaths from Cancer	Rate per 100,000 Population
	76,887	26	33.8
	80,671	31	38.4
	96,323	39	40.5
	111,975	44	39.3
	127,627	52	40.7
	143,279	51	35.6
	158,931	55	34.6
5	638,135	241	37.8

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	174,583	61	34.9
1907	190,235	92	48.4
1908	205,888	93	45.2
1909	221,541	130	58.7
1910	237,194	141	59.4
1906-1910	1,029,441	517	50.2
1911	252,847	144	57.0
1912	268,500	154	57.4
1913	284,153	193	67.9
1914	299,806	210	70.0

Source: Annual Reports of the Department of Health and Sanitation of the City of Seattle, Wash.

APPENDIX F (PART II)

Table 168
Mortality from Cancer in Seattle, Wash., by Organs and Parts
1901-1912

Organ or Part	Deaths from Cancer	Rate per 100,000 Population
Buccal cavity	45	2.1
Stomach and liver	421	19.2
Peritoneum, intestines and rectum	133	6.1
Female generative organs	192	8.8
Breast	74	3.4
Skin	24	1.1
Other or not specified organs	167	7.5
All organs	1,056	48.2

Source: Annual Reports of the Department of Health and Sanitation of the City of Seattle, Wash.

Table 169
Mortality from Cancer in Springfield, Mass.
1890-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1890	44,179	24	54.3	1901	64,745	40	61.8
				1902	67,431	57	84.5
1891	45,967	26	56.6	1903	70,117	60	85.6
1892	47,755	25	52.4	1904	72,804	69	94.8
1893	49,543	24	48.4	1905	75,491	74	98.0
1894	51,331	27	52.6				
1895	53,119	32	60.2	1901-1905	350,588	300	85.6
1891-1895	247,715	134	54.1	1906	78,178	66	84.4
				1907	80,865	64	79.1
1896	54,907	36	65.6	1908	83,552	84	100.5
1897	56,695	45	79.4	1909	86,239	65	75.4
1898	58,483	45	76.9	1910	88,926	84	94.5
1899	60,271	42	69.7				
1900	62,059	48	77.3	1906-1910	417,760	363	86.9
1896-1900	292,415	216	73.9	1911	91,613	82	89.5
				1912	94,300	92	97.6
				1913	96,987	109	112.4

Source: Municipal Register of the City of Springfield, Mass.

APPENDIX F (PART II)

Table 170
Mortality from Cancer in Springfield, Mass., Males
1891-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	22,123	8	36.2	1901	30,976	9	29.1
1892	22,955	9	39.2	1902	32,336	14	43.3
1893	23,787	4	16.8	1903	33,696	16	47.5
1894	24,619	8	32.5	1904	35,056	12	34.2
1895	25,451	7	27.5	1905	36,416	26	71.4
1891-1895	118,935	36	30.3	1901-1905	168,480	77	45.7
1896	26,284	9	34.2	1906	37,777	21	55.6
1897	27,117	13	47.9	1907	39,138	22	56.2
1898	27,950	10	35.8	1908	40,499	33	81.5
1899	28,783	12	41.7	1909	41,860	24	57.3
1900	29,616	9	30.4	1910	43,221	29	67.1
1896-1900	139,750	53	37.9	1906-1910	202,495	129	63.7
				1911	44,582	26	58.3
				1912	45,943	28	60.9
				1913	47,304	40	84.6

Source: Municipal Register of the City of Springfield, Mass.

Table 171
Mortality from Cancer in Springfield, Mass., Females
1891-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	23,844	18	75.5	1901	33,769	31	91.8
1892	24,800	16	64.5	1902	35,095	43	122.5
1893	25,756	20	77.7	1903	36,421	44	120.8
1894	26,712	19	71.1	1904	37,748	57	151.0
1895	27,668	25	90.4	1905	39,075	48	122.8
1891-1895	128,780	98	76.1	1901-1905	182,108	223	122.5
1896	28,623	27	94.3	1906	40,401	45	111.4
1897	29,578	32	108.2	1907	41,727	42	100.7
1898	30,533	35	114.6	1908	43,053	51	118.5
1899	31,488	30	95.3	1909	44,379	41	92.4
1900	32,443	39	120.2	1910	45,705	55	120.3
1896-1900	152,665	163	106.8	1906-1910	215,265	234	108.7
				1911	47,031	56	119.1
				1912	48,357	64	132.3
				1913	49,683	69	138.9

Source: Municipal Register of the City of Springfield, Mass.

Table 172
Mortality from Cancer in Springfield, Mass., by Organs and Parts according to Sex, 1908-1912

Organ or Part	TOTAL Deaths from Cancer	TOTAL Rate per 100,000 Population	MALES Deaths from Cancer	MALES Rate per 100,000 Population	FEMALES Deaths from Cancer	FEMALES Rate per 100,000 Population
Buccal cavity...............	14	3.1	12	5.6	2	0.9
Stomach and liver...........	132	29.7	55	25.5	77	33.7
Peritoneum, intestines, rectum	71	16.0	33	15.3	38	16.6
Female generative organs.....	64	14.4	..	..	64	28.0
Breast......................	46	10.3	..	..	46	20.1
Skin........................	13	2.9	8	3.7	5	2.2
Other or not specified organs ..	67	15.1	32	14.7	35	15.3
All organs..................	407	91.5	140	64.8	267	116.8

Source: Municipal Register of the City of Springfield, Mass.

Table 173
Mortality from Cancer in St. Louis, Mo. 1881-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	359,631	158	43.9
1882	368,981	126	34.1
1883	378,575	178	47.0
1884	388,418	171	44.0
1885	398,517	152	38.1
1881-1885	1,894,122	785	41.4
1886	408,878	149	36.4
1887	419,509	164	39.1
1888	429,390	170	39.6
1889	440,554	189	42.9
1890	451,770	263	58.2
1886-1890	2,150,101	935	43.5
1891	462,816	275	59.4
1892	474,132	248	52.3
1893	485,725	243	50.0
1894	497,601	224	45.0
1895	509,707	268	52.6
1891-1895	2,429,981	1,258	51.8
1896	522,209	268	51.3
1897	534,977	266	49.7
1898	548,057	304	55.5
1899	561,456	297	52.9
1900	575,238	345	60.0
1896-1900	2,741,937	1,480	54.0
1901	586,417	345	58.8
1902	597,596	356	59.6
1903	608,775	392	64.4
1904	619,954	374	60.3
1905	631,133	419	66.4
1901-1905	3,043,875	1,886	62.0
1906	642,312	443	69.0
1907	653,491	479	73.3
1908	664,670	548	82.4
1909	675,849	569	84.2
1910	687,029	568	82.7
1906-1910	3,323,351	2,607	78.4
1911	698,208	526	75.3
1912	709,387	604	85.1
1913	720,566	682	94.6

Source: Annual and Monthly Reports of the Health Department of St. Louis, Mo.

APPENDIX F (PART II)

Table 174
Mortality from Cancer in St. Louis, Mo., Males
1887-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1887	212,691	71	33.4
1888	217,400	74	34.0
1889	222,744	77	34.6
1890	228,099	127	55.7
1887-1890	880,934	349	39.6
1891	233,491	115	49.3
1892	239,010	106	44.3
1893	244,660	86	35.2
1894	250,443	100	39.9
1895	256,332	111	43.3
1891-1895	1,223,936	518	42.3
1896	262,410	116	44.2
1897	268,612	108	40.2
1898	274,960	137	49.8
1899	281,458	127	45.1
1900	288,194	117	40.6
1896-1900	1,375,634	605	44.0
1901	293,912	151	51.4
1902	299,635	150	50.1
1903	305,362	182	59.6
1904	311,155	161	51.7
1905	316,955	162	51.1
1901-1905	1,527,019	806	52.8
1906	322,762	213	66.0
1907	328,575	202	61.5
1908	334,395	229	68.5
1909	340,222	246	72.3
1910	346,057	248	71.7
1906-1910	1,672,011	1,138	68.1
1911	351,897	213	60.5
1912	357,744	260	72.7
1913	363,588	325	89.4

Source: Annual and Monthly Reports of the Health Department of St. Louis, Mo.

Table 175
Mortality from Cancer in St. Louis Mo., Females
1887-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1887	206,818	93	45.0
1888	211,990	96	45.3
1889	217,810	112	51.4
1890	223,671	136	60.8
1887-1890	860,289	437	50.8
1891	229,325	160	69.8
1892	235,122	142	60.4
1893	241,065	157	65.1
1894	247,158	124	50.2
1895	253,375	157	62.0
1891-1895	1,206,045	740	61.4
1896	259,799	152	58.5
1897	266,365	158	59.3
1898	273,097	167	61.2
1899	279,998	170	60.7
1900	287,044	228	79.4
1896-1900	1,366,303	875	64.0
1901	292,505	194	66.3
1902	297,961	206	69.1
1903	303,413	210	69.2
1904	308,799	213	69.0
1905	314,178	257	81.8
1901-1905	1,516,856	1,080	71.2
1906	319,550	230	72.0
1907	324,916	277	85.3
1908	330,275	319	96.6
1909	335,627	323	96.2
1910	340,972	320	93.8
1906-1910	1,651,340	1,469	89.0
1911	346,311	313	90.4
1912	351,643	344	97.8
1913	356,978	357	100.0

Source: Annual and Monthly Reports of the Health Department of St. Louis, Mo.

APPENDIX F (PART II)

Table 176
Mortality from Cancer in St. Paul, Minn.
1885-1913

Year (Ending October 31)	Population	Deaths from Cancer	Rate per 100,000 Population
1885	74,305	36	48.4
1886 (Calendar)	83,497	29	34.7
1887	93,826	23	24.5
1888	..	..	..
1889	118,474	39	32.9
1890	133,156	45	33.8
1886-1890	428,953	136	31.7
1891	134,583	62	46.1
1892	136,010	62	45.6
1893	137,437	58	42.2
1894	138,864	51	36.7
1895	140,292	67	47.8
1891-1895	687,186	300	43.7
1896	144,846	67	46.3
1897	149,400.	52	34.8
1898	153,955	74	48.1
1899	158,510	66	41.6
1900	163,065	92	56.4
1896-1900	769,776	351	45.6
1901	169,856	60	35.3
1902	176,647	83	47.0
1903	183,439	107	58.3
1904	190,231	115	60.5
1905	197,023	115	58.4
1901-1905	917,196	480	52.3
1906	200,567	121	60.3
1907	204,111	135	66.1
1908	207,655	159	76.6
1909	211,199	143	67.7
1910	214,744	180	83.8
1906-1910	1,038,276	738	71.1
1911	218,288	160	73.3
1912	221,832	160	72.1
1913	225,376	187	83.0

Source: Annual Reports of the Board of Health of the City of St. Paul, Minn.

APPENDIX F (PART II)

Table 177

Mortality from Cancer in District of Columbia 1879-1914

Population	Deaths from Cancer	Rate per 100,000 Population
171,919	94	54.7
177,624	78	43.9
182,900	87	47.6
188,176	80	42.5
193,453	77	39.8
198,730	88	44.3
204,007	119	58.3
967,266	451	46.6
209,284	101	48.3
214,561	112	52.2
219,838	103	46.9
225,115	118	52.4
230,392	121	52.5
1,099,190	555	50.5
235,224	131	55.7
240,056	111	46.2
244,888	152	62.1
249,720	130	52.1
254,553	140	55.0
1,224,441	664	54.2
259,386	155	59.8
264,219	144	54.5
269,052	160	59.5
273,885	177	64.6
278,718	204	73.2
1,345,260	840	62.4

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	283,953	194	68.3
1902	289,188	218	75.4
1903	294,423	220	74.7
1904	299,658	228	76.1
1905	304,893	231	75.8
1901-1905	1,472,115	1,091	74.1
1906	310,128	253	81.6
1907	315,363	280	88.8
1908	320,598	275	85.8
1909	325,833	278	85.3
1910	331,069	293	88.5
1906-1910	1,602,991	1,379	86.0
1911	336,305	286	85.0
1912	341,541	323	94.6
1913	346,777	351	101.2
1914	352,015	344	97.7

Source: Annual Reports of the Health Officer of the District of Columbia.
Note: 1902-1914, Calendar Years.

APPENDIX F (PART II)

Table 178
Mortality from Cancer in District of Columbia, Males
1879-1913

Year (Ending June 30)	Population	Deaths from Cancer	Rate per 100,000 Population
1879	80,842	18	22.3
1880	83,578	28	33.5
1882	88,778	29	32.7
1883	91,378	24	26.3
1884	93,978	26	27.7
1885	96,579	35	36.2
1882-1885	370,713	114	30.8
1886	99,180	30	30.2
1887	101,781	33	32.4
1888	104,382	32	30.7
1889	106,983	28	26.2
1890	109,584	32	29.2
1886-1890	521,910	155	29.7
1891	111,826	41	36.7
1892	114,068	41	35.9
1893	116,310	50	43.0
1894	118,552	59	49.8
1895	120,794	45	37.3
1891-1895	581,550	236	40.6
1896	123,036	41	33.3
1897	125,278	51	40.7
1898	127,520	51	40.0
1899	129,762	58	44.7
1900	132,004	70	53.0
1896-1900	637,600	271	42.5
Year	**Population**	**Deaths from Cancer**	**Rate per 100,000 Population**
1901	134,608	65	48.3
1902	137,212	77	56.1
1903	139,816	70	50.1
1904	142,420	79	55.5
1905	145,025	82	56.5
1901-1905	699,081	373	53.4
1906	147,630	105	71.1
1907	150,235	94	62.6
1908	152,840	100	65.4
1909	155,445	111	71.4
1910	158,050	116	73.4
1906-1910	764,200	526	68.8
1911	160,655	108	67.2
1912	163,260	127	77.8
1913	165,865	137	82.6

Source: Annual Reports of the Health Officer of the District of Columbia.
Note: 1902-1913, Calendar Years.

APPENDIX F (PART II)

Table 179
Mortality from Cancer in District of Columbia, Females
1879-1913

Population	Deaths from Cancer	Rate per 100,000 Population
91,077	76	83.4
94,046	50	53.2
99,398	51	51.3
102,075	53	51.9
104,752	62	59.2
107,428	84	78.2
413,653	250	60.4
110,104	71	64.5
112,780	79	70.0
115,456	71	61.5
118,132	90	76.2
120,808	89	73.7
577,280	400	69.3
123,398	90	72.9
125,988	70	55.6
128,578	102	79.3
131,168	71	54.1
133,759	95	71.0
642,891	428	66.6
136,350	114	83.6
138,941	93	66.9
141,532	109	77.0
144,123	119	82.6
146,714	134	91.3
707,660	569	80.4

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	149,345	129	86.4
1902	151,976	141	92.8
1903	154,607	150	97.0
1904	157,238	149	94.8
1905	159,868	149	93.2
1901-1905	773,034	718	92.9
1906	162,498	148	91.1
1907	165,128	186	112.6
1908	167,758	175	104.3
1909	170,388	167	98.0
1910	173,019	177	102.3
1906-1910	838,791	853	101.7
1911	175,650	178	101.3
1912	178,281	196	109.9
1913	180,912	214	118.3

Source: Annual Reports of the Health Officer of the District of Columbia.
Note: 1902-1913, Calendar Years.

APPENDIX F (PART II)

Table 180
Mortality from Cancer in District of Columbia, White
1882-1914

Year (Ending June 30)	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1882	125,343	55	43.9	1901	195,991	137	69.9
1883	129,012	51	39.5	1902	200,450	173	86.3
1884	132,681	64	48.2	1903	204,909	162	79.1
1885	136,350	86	63.1	1904	209,368	173	82.6
				1905	213,828	179	83.7
1882-1885	523,386	256	48.9				
				1901-1905	1,024,546	824	80.4
1886	140,019	78	55.7				
1887	143,688	78	54.3	1906	218,288	188	86.1
1888	147,357	77	52.3	1907	222,748	219	98.3
1889	151,026	98	64.9	1908	227,208	206	90.7
1890	154,695	92	59.5	1909	231,668	209	90.2
				1910	236,128	239	101.2
1886-1890	736,785	423	57.4				
				1906-1910	1,136,040	1,061	93.4
1891	158,378	90	56.8				
1892	162,061	87	53.7	1911	240,587	215	89.4
1893	165,744	116	70.0	1912	245,046	245	100.0
1894	169,428	98	57.8	1913	249,508	278	111.4
1895	173,112	111	64.1	1914	253,970	259	102.0
1891-1895	828,723	502	60.6				
1896	176,796	115	65.0				
1897	180,480	98	54.3				
1898	184,164	118	64.1				
1899	187,848	126	67.1				
1900	191,532	145	75.7				
1896-1900	920,820	602	65.4				

Source: Annual Reports of the Health Officer of the District of Columbia.
Note: 1902-1914, Calendar Years.

APPENDIX F (PART II)

Table 181
Mortality from Cancer in District of Columbia, Colored
1882-1914

	Population	Deaths from Cancer	Rate per 100,000 Population
	62,833	25	39.8
	64,441	26	40.3
	66,049	24	36.3
	67,657	33	48.8
5	260,980	108	41.4
	69,265	23	33.2
	70,873	34	48.0
	72,481	26	35.9
	74,089	20	27.0
	75,697	29	38.3
0	362,405	132	36.4
	76,846	41	53.4
	77,995	24	30.8
	79,144	36	45.5
	80,292	32	39.9
	81,441	29	35.6
5	395,718	162	40.9
	82,590	40	48.4
	83,739	46	54.9
	84,888	42	49.5
	86,037	51	59.3
	87,186	59	67.7
0	424,440	238	56.1

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	87,962	57	64.8
1902	88,738	45	50.7
1903	89,514	58	64.8
1904	90,290	55	60.9
1905	91,065	52	57.1
1901-1905	447,569	267	59.7
1906	91,840	65	70.8
1907	92,615	61	65.9
1908	93,390	69	73.9
1909	94,165	69	73.3
1910	94,941	54	56.9
1906-1910	466,951	318	68.1
1911	95,718	71	74.2
1912.	96,494	78	80.8
1913	97,269	73	75.0
1914	98,045	85	86.7

Source: Annual Reports of the Health Officer of the District of Columbia.
Note: 1902-1914, Calendar Years.

APPENDIX F (PART II)

Table 182

Mortality from Cancer, by Organs and Parts, in the District of Columbia according to Age, White Males, 1901-1910

	Buccal Cavity		Stomach and Liver	
	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population
Under 10	..	..	..	..
10–19	1	0.6	1	0.6
20–29	..	..	3	1.4
30–39	2	1.1	18	9.7
40–49	4	3.0	38	28.3
50–59	17	19.0	80	89.5
60–69	13	23.0	125	221.0
70 and over	12	37.0	87	268.3
All ages	49	4.6	352	33.4
40 and over	46	14.7	330	105.5
	Peritoneum Intestines and Rectum		Skin	
Under 10	1	0.6	..	..
10–19	3	1.8	..	..
20–29	3	1.4	1	0.5
30–39	12	6.5	..	..
40–49	15	11.2	3	2.2
50–59	21	23.5	11	12.3
60–69	32	56.6	15	26.5
70 and over	21	64.8	18	55.5
All ages	108	10.2	48	4.6
40 and over	89	28.5	47	15.0
	Other or Not Specified Organs		All Organs and Parts	
Under 10	2	1.1	3	1.7
10–19	2	1.2	7	4.2
20–29	5	2.4	12	5.8
30–39	11	5.9	43	23.2
40–49	24	17.9	84	62.5
50–59	34	38.1	163	182.4
60–69	49	86.6	234	413.7
70 and over	60	185.0	198	610.6
All ages	187	17.7	744	70.6
40 and over	167	53.4	679	217.1

APPENDIX F (PART II)

Table 183

lty from Cancer, by Organs and Parts, in the District of Columbia according to Age, White Females, 1901-1910

	Buccal Cavity		Stomach and Liver		Peritoneum Intestines and Rectum	
	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population
)...........	..	..	..	..	..	..
....	..	..	..	..	..	..
....	1	0.4	2	0.9	1	0.4
....	..	..	17	8.7	11	5.6
....	2	1.4	44	31.3	24	17.1
....	..	..	83	87.6	45	47.5
....	6	9.5	96	151.6	33	52.1
)ver........	3	8.6	59	168.5	23	65.7
....	12	1.1	301	27.1	137	12.4
ver.........	11	3.3	282	84.5	125	37.5

	Female Generative Organs		Breast		Skin	
	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population
)...........	..	..	..	..	..	..
....	1	0.6	..	..	1	0.6
....	..	..	..	..	..	..
....	49	24.9	16	8.1	1	0.5
....	88	62.6	48	34.1	2	1.4
....	101	106.6	63	66.5	3	3.2
....	59	93.2	55	86.9	6	9.5
)ver........	33	94.2	43	122.8	12	34.3
....	331	29.9	225	20.3	25	2.3
ver.........	281	84.2	209	62.6	23	6.9

	Other or Not Specified Organs		All Organs and Parts	
	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population
Under 10...........	1	0.6	1	0.6
10–19..............	1	0.6	3	1.7
20–29..............	3	1.3	7	3.1
30–39..............	16	8.1	110	56.0
40–49..............	20	14.2	228	162.2
50–59..............	34	35.9	329	347.3
60–69..............	34	53.7	289	456.4
70 and over........	22	62.8	195	556.9
All ages............	131	11.8	1,162	104.8
40 and over.........	110	33.0	1,041	312.0

APPENDIX F (PART II)

Table 184

Mortality from Cancer, by Organs and Parts, in the District of Columbia according to Age, Colored Males, 1901-1910

	Buccal Cavity		Stomach and Liver		Peritoneum Intestines and Rectum	
	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population
Under 10	..	..	..	..	..	..
10–19	..	..	..	..	..	..
20–29	..	..	3	3.2	2	2.2
30–39	1	1.4	11	15.2	..	..
40–49	2	4.1	15	30.5	1	2.0
50–59	2	6.5	26	84.4	5	16.2
60–69	3	22.7	22	166.4	5	37.8
70 and over	5	76.2	10	152.3	3	45.7
All ages	13	3.2	87	21.3	16	3.9
40 and over	12	12.0	73	73.1	14	14.0

	Breast		Skin		Other Organs	
	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population
Under 10	..	..	..	..	..	..
10–19	..	..	..	..	..	..
20–29	..	..	2	2.2	2	2.2
30–39	..	..	2	2.8	5	6.9
40–49	..	..	1	2.0	5	10.2
50–59	1	3.2	2	6.5	7	22.7
60–69	..	..	2	15.1	9	68.1
70 and over	..	..	..	..	4	60.9
All ages	1	0.2	9	2.2	32	7.8
40 and over	1	1.0	5	5.0	25	25.0

	All Organs	
	Deaths from Cancer	Rate per 100,000 Population
Under 10	..	..
10–19	..	..
20–29	9	9.7
30–39	19	26.3
40–49	24	48.7
50–59	43	139.6
60–69	41	310.1
70 and over	22	335.1
All ages	158	38.6
40 and over	130	130.2

Table 185

ality from Cancer, by Organs and Parts, in the District of Columbia according to Age, Colored Females, 1901-1910

	Buccal Cavity		Stomach and Liver		Peritoneum Intestines and Rectum	
	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population
10	..	..	..	..	..	..
	..	..	..	..	1	1.1
	1	0.8	4	3.1	2	1.5
	2	2.3	10	11.3	5	5.6
	2	3.4	16	27.4	7	12.0
	2	5.9	31	91.0	12	35.2
	3	17.6	14	82.0	3	17.6
l over	3	30.1	16	160.6	4	40.2
es	13	2.6	91	18.1	34	6.8
l over	10	8.4	77	64.5	26	21.8

	Female Generative Organs		Breast		Skin	
	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population
10	1	1.3	..	..	..	..
	..	..	..	..	..	..
	6	4.6	3	2.3	..	..
	34	38.4	9	10.2	1	1.1
	65	111.4	21	36.0	..	..
	42	123.3	15	44.1	..	..
	25	146.5	15	87.9	..	..
l over	15	150.6*	10	100.4	..	..
es	188	37.4	73	14.5	1	0.2
l over	147	123.1	61	51.1	..	..

	Other Organs		All Organs	
	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population
Under 10	1	1.3	2	2.7
10–19	..	..	1	1.1
20–29	1	0.8	17	13.1
30–39	3	3.4	64	72.3
40–49	10	17.1	121	207.3
50–59	10	29.4	112	328.9
60–69	6	35.1	66	386.6
70 and over	4	40.2	52	522.1
All ages	35	7.0	435	86.5
40 and over	30	25.1	351	293.9

ote: Tables 182-185 are from the same source as Tables 177-181, but data are for dar Years.

APPENDIX

G

CANCER MORTALITY STATISTICS OF FOREIGN COUNTRIES

Table	Country	Period	Title	Page
1	CIVILIZED WORLD	1908-1912	Persons	593
2	PRINCIPAL COUNTRIES	1901-1905—1906-1910	Persons	593
3	SELECTED COUNTRIES	1908-1912	Crude and Standardized Rates	593
4	EUROPE		By Countries	594
5	Countries of Europe	1896-1910	Comparative Statement	595
6	England and Wales	1881-1913	Persons	596
7	" "	1881-1913	Males	596
8	" "	1881-1913	Females	597
9	" "	1901-1910	By Age and Sex	597
10	" "	1908-1912	By Organs and Parts, according to Sex	598
11	" "	1897-1900—1901-1910	By Organs and Parts, Males	599
12	" "	1897-1900—1901-1910	By Organs and Parts, Females	600
13	" "	1901-1910	Relative Mortality, by Organs and Parts, according to Sex	601
14	" "	1903-1912	Female Breast	601
15	" "	1911-1912	Urban and Rural, by Organs and Parts, according to Sex	602
15a	" "	1911-1913	Cancer of the Ovary, by Age and Conjugal Condition	603
15b	" "	1911-1913	Cancer of the Uterus, by Age and Conjugal Condition	603
15c	" "	1911-1913	Cancer of the Breast, by Age and Conjugal Condition	604
15d	London	1649-1758	Cancer, Fistula and Gangrene	604
16	"	1881-1913	Persons	605
17	"	1881-1913	Males	605
18	"	1881-1913	Females	606
19	Sheffield	1887-1913	Persons	607

APPENDIX G

Country	Period	Title	Page
England and Wales (*continued*)			
Sheffield	1887-1913	Males	607
"	1887-1913	Females	608
Liverpool	1889-1913	Persons	608
"	1889-1913	Males	609
"	1889-1913	Females	609
Birmingham	1891-1912	Persons	610
"	1904-1912	By Sex	610
Leeds	1893-1913	Persons	611
Bristol	1894-1913	Persons	611
Manchester	1891-1912	Persons	612
"	1891-1912	Males	612
"	1891-1912	Females	613
Scotland	1881-1912	Persons	613
"	1906-1912	By Sex	614
"	1906-1910	By Organs and Parts, according to Sex	614
"	1906-1910	Relative Mortality, by Organs and Parts, according to Sex	615
Aberdeen	1899-1913	Persons	615
Edinburgh	1898-1913	Persons	616
"	1898-1913	Males	616
"	1898-1913	Females	617
Glasgow	1881-1913	Persons	617
Ireland	1881-1912	Persons	618
"	1893-1912	Males	619
"	1893-1912	Females	619
"	1901-1910	By Provinces and Counties	620
"	1901-1910	By Organs and Parts, according to Sex	621
"	1901-1910	By Age and Sex	622
"	1901	By Organs and Parts and Duration of Illness, Males	623
"	1901	By Organs and Parts and Duration of Illness, Females	624
Dublin	1901-1912	Persons	625
Belfast	1901-1912	Persons	625
Isle of Man	1902-1913	Persons	626
"	1902-1913	Males	626
"	1902-1913	Females	627
Guernsey, Channel Islands	1900-1913	Persons	627
Gibraltar	1900-1913	Persons	628
Malta and Gozo	1896-1912	Persons	628
" "	1911-1913	By Organs and Parts, according to Sex	629
Norway	1881-1912	Persons	629
"	1896-1912	Males	630

APPENDIX G

Table	Country	Period	Title	Page
60	Norway	1896-1912	Females	630
61	"	1896-1910	By Organs and Parts, according to Sex	631
62	"	1896-1910	Relative Mortality, by Organs and Parts, according to Sex	631
63	"	1896-1910	By Age and Sex	631
64	"	1896-1910	By Organs and Parts, according to Age, Males	632
65	"	1896-1910	By Organs and Parts, according to Age, Females	632
66	"	1896-1901	Urban and Rural, by Organs and Parts, according to Sex	633
67	"	1896-1907	By Organs and Parts, and Geographical Divisions	633
68	Kristiania	1896-1912	Persons	633
69	Bergen	1896-1912	Persons	634
70	Hammerfest	1896-1911	Persons	634
71	Sweden	1901-1912	By Cities	634
72	"	1911	Urban and Rural, by Sex	634
73	"	1905	By Provinces and Sex	635
74	"	1905	Urban and Rural, by Organs and Parts, Males	636
75	"	1905	Urban and Rural, by Organs and Parts, Females	636
76	Stockholm	1908-1913	Persons	637
77	Göteborg	1908-1913	Persons	637
78	Denmark	1881-1912	By Cities	637
79	"	1894-1912	By Cities, Males	638
80	"	1894-1912	By Cities, Females	638
81	"	1908-1912	Cities, by Organs and Parts, according to Sex	638
82	Copenhagen	1894-1912	Persons	639
83	"	1894-1912	By Sex	639
84	Iceland	1908	By Organs and Parts, according to Sex	640
85	Finland	1909	By Organs and Parts, according to Sex	640
86	"	1890-1907	By Organs and Parts	641
87	" and Sweden	1890-1907	By Organs and Parts	641
87a	"	1910	By Cities	641
88	German Empire	1891-1912	Persons	642
89	" "	1905-1912	By Sex	642
90	Bavaria	1886-1912	Persons	643
91	"	1886-1912	Males	643
92	"	1886-1912	Females	644

Country	Period	Title	Page
German Empire (*continued*)			
Bavaria	1905-1907	By Geographical Divisions, Males	644
"	1905-1907	By Geographical Divisions, Females	645
"	1905-1910	By Organs and Parts, according to Sex	645
"	1901-1912	By Age	646
Prussia	1881-1912	Persons	646
"	1898-1912	Males	647
"	1898-1912	Females	647
"	1903-1913	By Age and Sex	647
Württemberg	1904-1912	By Sex	648
Baden	1881-1912	Persons	648
"	1905-1912	By Sex	649
Saxony	1904-1912	By Sex	649
Alsace-Lorraine	1905-1912	Persons	650
Grand-Duchy of Hesse	1901-1912	By Religion, according to Age and Sex	650
Heligoland	1840-1903	Persons	650
"	1840-1903	By Organs and Parts, according to Sex	651
Hamburg	1900-1912	By Sex	651
Bremen	1896-1913	Persons	652
"	1896-1911	By Sex	652
Berlin	1881-1912	Persons	653
"	1881-1912	Males	653
"	1881-1912	Females	654
Frankfurt a/M	1891-1913	Persons	654
"	1892-1913	Males	655
"	1892-1913	Females	655
"	1906-1912	By Organs and Parts, according to Sex	656
Cologne	1891-1912	Persons	656
Essen a/R.	1906-1912	By Sex	657
Munich	1896-1912	Persons	657
"	1896-1911	By Sex	658
"	1907-1909	By Religious Confession, according to Organs and Parts, Females	658
Dresden	1886-1912	Persons	659
Leipzig	1881-1912	Persons	659
Königsberg	1881-1912	Persons	660
Nuremberg	1881-1912	Persons	660
Holland	1881-1913	Persons	661
"	1901-1913	By Sex	661
"	1906-1912	By Organs and Parts, according to Sex	662
Amsterdam	1881-1913	Persons	662
"	1901-1912	By Sex	663

Table	Country	Period	Title	Page
	Holland (*continued*)			
130	Amsterdam	1862-1902	By Organs and Parts, Males	663
131	"	1862-1902	By Organs and Parts, Females	664
132	"	1897-1902	By Organs and Parts, according to Age, Males	664
133	"	1897-1902	By Organs and Parts, according to Age, Females	665
134	The Hague	1901-1913	Persons	665
135	"	1901-1912	By Sex	666
136	Rotterdam	1901-1913	Persons	666
137	"	1901-1912	By Sex	667
138	Belgium	1903-1912	Persons	667
139	"	1903-1912	Males	667
140	"	1903-1912	Females	668
141	Liege	1903-1912	Persons	668
142	"	1905-1912	By Sex	668
143	Antwerp	1896-1912	Persons	669
144	Brussels	1901-1912	Persons	669
145	France	1892-1911	Persons	670
146	"	1906-1910	By Cities, according to Size	670
147	Paris	1881-1913	Persons	671
148	"	1893-1913	Males	671
149	"	1893-1913	Females	672
150	Lyons	1910-1912	Persons	672
151	Bordeaux	1909-1912	Persons	672
152	Nice	1909-1912	Persons	672
153	Lille	1891-1912	Persons	673
154	Nancy	1901-1912	Persons	673
155	Le Hâvre	1901-1912	Persons	673
156	Switzerland	1881-1912	Persons	674
157	"	1881-1885—1901-1912	Males	674
158	"	1881-1885—1901-1912	Females	675
159	"	1901-1910	By Organs and Parts, according to Sex	675
160	"	1901-1910	Relative Mortality, by Organs and Parts, according to Sex	676
161	"	1906-1910	By Organs and Parts, according to Sex	676
162	"	1906-1910	By Cantons and Race	677
163	"	1901-1910	By Age and Sex	677
164	Bern	1901-1912	Persons	678
165	Basel	1901-1912	Persons	678
166	Geneva	1901-1912	Persons	678
167	Zurich	1901-1912	Persons	678

APPENDIX G

Country	Period	Title	Page
Austria	1895-1912	Persons	679
"	1901-1912	By Sex	679
"	1907-1911	By Provinces and Race	680
"	1909-1910	By Principal Cities	681
Vienna	1900-1912	Persons	681
"	1900-1912	By Sex	682
"	1898-1912	Jewish Population	682
"	1898-1912	Jewish Population, by Sex	683
Hungary	1897-1912	Persons	683
"	1897-1908	By Sex	684
"	1901-1904	By Organs and Parts, according to Sex	685
"	1904	Percentage of Distribution, by Organs and Parts, according to Sex	685
"	1901-1904	By Race	686
Budapest	1881-1912	Persons	686
"	1881-1912	Males	687
"	1881-1912	Females	687
"	1902-1906	By Religious Confession	688
Italy	1887-1912	Persons	688
"	1896-1912	Males	689
"	1896-1912	Females	689
"	1906-1910	By Provinces	690
"	1891-1910	By Organs and Parts	690
Rome	1898-1912	Persons	691
Naples	1898-1912	Persons	691
Genoa	1898-1912	Persons	691
Turin	1898-1912	Persons	692
Milan	1898-1912	Persons	692
Florence	1898-1912	Persons	692
Palermo	1898-1912	Persons	693
Spain	1900-1912	Persons	693
"	1900	Urban and Rural, by Organs and Parts	693
"	1901-1905	By Organs and Parts, according to Sex	694
Madrid	1901-1910	Persons	694
Portugal	1902-1910	Persons	694
"	1902-1910	By Sex	695
"	1906-1910	By Provinces	695
"	1904	By Organs and Parts, according to Sex (Cancer Census)	696
Porto	1893-1910	Persons	696
Lisbon	1902-1910	Persons	697

APPENDIX G

Table	Country	Period	Title	Page
	Russia			
206	Moscow	1892-1910	By Sex	697
207	"	1910-1912	Persons	697
208	Petrograd	1911-1912	Persons	697
208a	Warsaw	1881-1912	Persons	698
209	Serbia	1892-1912	Persons	698
210	"	1907-1912	Cities	699
211	Greece	1900-1908	Twelve Cities	699
212	"	1905-1908	Twelve Cities, by Organs and Parts, according to Sex	699
213	Athens	1900-1908	By Sex	700
214	Roumania	1901-1912	By Cities	701
	Turkey			
215	Constantinople	1908-1912	Persons	701
216	"	1908-1912	By Religion	701
217	AFRICA		By Countries	702
218	Algeria	1904-1912	European Population	702
219	Mauritius	1898-1912	Persons	703
220	"	1898-1908	Public Hospital Cases	703
221	Union of South Africa	1912	By Organs and Parts, according to Sex, White	703
222	" " "	1912	By Provinces, White	704
223	Cape Colony	1900-1908	Twenty-five Cities and Towns	704
224	Johannesburg	1909-1911	By Race	704
225	Natal	1902-1912	European Population.	705
226	"	1903-1912	East Indians	705
227	Sierra Leone	1870-1909	Cases in the Colonial Hospital	705
228	" "	1900-1909	Cases in the Colonial Hospital, by Organs and Parts	706
229	Freetown	1910-1911	Persons	706
	Portuguese Colonies			
230	Cape Verde Islands	1892-1904	Cases of Tumor, Hospital da Praia, by Race	706
231	" " "	1892-1904	Cases of Cancer, Hospital da Praia, by Organs and Parts, according to Race and Sex	707
232	ASIA		By Countries	708
	India			
233	Calcutta	1881-1913	Persons	708
234	Province of Bengal	1911-1912	Morbidity and Mortality in Hospitals	709
235	Ceylon	1881-1913	Persons	709
236	"	1911-1913	By Organs and Parts	710
237	"	1911-1913	By Organs and Parts, according to Race	710
238	"	1911-1913	By Administrative Divisions	711

APPENDIX G

Table	Country	Period	Title	Page
239	Straits Settlements	1904-1912	Cases of Cancer in the Hospitals	711
240	Singapore	1904-1913	Persons	712
241	Province of Penang	1909-1913	Persons	712
242	Singapore	1907-1912	Cases in Tan Toch Seng's Hospital, by Organs and Parts	712
243	Seychelles	1900-1902—1907-1911	Victoria Hospital Experience	713
244	"	1907-1911	Victoria Hospital Experience, by Organs and Parts	713
245	Dutch East Indies	1911-1912	Europeans	713
	China			
246	Hongkong	1901-1912	By Race	714
247	"	1895-1904	By Organs and Parts, Chinese Population	714
248	Shanghai	1898-1914	Resident Foreign Population	715
248a	Fukien	1911-1914	Yunghun Hospital Experience, by Organs and Parts	715
249	Japan	1899-1911	Persons	715
250	"	1899-1910	By Sex	716
251	"	1909-1910	By Organs and Parts, according to Sex	716
252	"	1908-1910	By Age and Sex	717
253	Tokyo	1904-1910	Persons	717
254	"	1904-1910	By Sex	718
255	Osaka	1906-1910	By Sex	718
256	Kyoto	1906-1910	By Sex	719
	Philippine Islands			
257	Manila	1903-1913	Persons	719
258	"	1908-1913	By Organs and Parts, according to Race	719
259	Australasia		By Countries	720
260	Commonwealth of Australia	1881-1913	Persons	720
261	" "	1908-1912	By Organs and Parts, according to Sex	721
262	" "	1908-1912	By Age and Sex	722
263	New South Wales	1881-1913	Persons	723
264	" " "	1881-1913	Males	724
265	" " "	1881-1913	Females	724
266	" " "	1881-1911	By Age and Sex	725
267	Sydney	1891-1913	Persons	726
268	"	1891-1913	Males	726
269	"	1891-1913	Females	727
270	Victoria	1881-1913	Persons	727
271	"	1881-1913	Males	728
272	"	1881-1913	Females	728
273	"	1880-82, 1890-92, 1900-02, 1909-11	By Age and Sex	729

Table	Country	Period	Title
	Commonwealth of Australia (*continued*)		
274	South Australia	1881-1913	Persons
275	" "	1882-1913	Males
276	" "	1882-1913	Females
277	Queensland	1881-1913	Persons
278	"	1893-1913	Males
279	"	1893-1913	Females
280	Tasmania	1884-1913	Persons
281	"	1892-1913	Males
282	"	1892-1913	Females
283	Western Australia	1881-1913	Persons
284	" "	1897-1913	Males
285	" "	1897-1913	Females
286	Northern Territory	1911-1913	Persons
287	New Zealand	1881-1913	Persons
288	" "	1889-1913	Males
289	" "	1889-1913	Females
290	Fiji	1898-1911	Colonial Hospital Experience
291	"	1905-1911	Colonial Hospital Experience, by Organ and Parts
292	"	1906-1911	Colonial Hospital Experience, by Race
293	Hawaii	1902-1913	Persons
294	"	1911-1913	By Race
295	"	1911-1913	By Organs and Parts according to Race
296	AMERICA		By Countries
	Canada		
297	Province of Ontario	1881-1913	Persons
298	Toronto	1881-1913	Persons
299	"	1881-1913	Males
300	"	1881-1913	Females
301	Montreal	1881-1913	Persons
302	City of Quebec	1894-1912	Persons
303	Winnipeg	1910-1913	By Sex
304	British Columbia	1901-1913	Persons
305	Nova Scotia	1910-1913	By Sex
306	Prince Edward Island	1913-1914	Persons
	New Brunswick		
307	St. John	1891-1913	Persons
308	Newfoundland and Labrador	1906-1913	Persons
309	Bermuda Islands	1891-1913	Persons
310	" "	1891-1913	Males
311	" "	1891-1913	Females
312	Jamaica	1881-1913	Persons
313	"	1881-1913	Males
314	"	1881-1913	Females
315	Windward and Leeward Islands	1901-1912	Persons

APPENDIX G

Table	Country	Period	Title	Page
316	Trinidad	1890-1913	Persons	750
317	Barbados	1899-1903	Hospital Experience	751
	Danish West Indies			
318	St. Thomas	1901-1914	Persons	751
319	British Honduras	1894-1913	Persons	751
320	British Guiana	1896-1913	Persons	752
321	" "	1896-1913	Males	752
322	" "	1896-1913	Females	753
	Dutch Guiana			
323	Paramaribo	1903-1912	Persons	753
324	"	1903-1912	By Sex	754
325	Cuba	1901-1913	Persons	754
326	"	1902-1913	By Sex	755
327	"	1908-1912	By Organs and Parts, according to Sex	755
328	"	1908-1912	By Organs and Parts, according to Race	756
329	Havana	1899-1912	Persons	756
330	Porto Rico	1910-1913	Persons	757
331	" "	1910-1913	By Organs and Parts	757
	Mexico			
332	City of Mexico	1905-1913	By Sex	758
333	" "	1908-1912	By Organs and Parts, according to Sex	759
334	Costa Rica	1901-1912	Persons	759
335	Nicaragua	1908-1911	Persons	759
	Salvador			
336	San Salvador	1912	By Organs and Parts	760
337	Venezuela	1905-1912	Persons	760
	Colombia			
338	Bogotá	1912-1913	Persons	760
	Ecuador			
339	Guayaquil	1910-1912	Persons	760
	Bolivia			
340	La Paz	1900-1909	Persons	760
	Peru			
341	Lima	1904	By Organs and Parts, according to Sex	761
342	Trujillo	1903-1913	Persons	761
	Brazil			
343	City of Rio de Janeiro	1891-1913	Persons	762
344	Fed. Dist. of Rio de Janeiro	1903-1913	Persons	762
345	" " "	1906-1910	By Organs and Parts, Males	763
346	" " "	1906-1910	By Organs and Parts, Females	763
347	City of Bahia	1897-1912	Persons	764
348	" "	1900-1911	Males	764
349	" "	1900-1911	Females	765
350	" "	1904-1908	By Organs and Parts, according to Sex	765

APPENDIX G

Table	Country	Period	Title	Page
	Brazil (*continued*)			
351	City of Sao Paulo	1896-1913	Persons	766
352	" " "	1901-1913	Males	766
353	" " "	1901-1913	Females	766
354	State of Paraná	1906-1910	Persons	767
355	Pelotas	1906-1913	Persons	767
356	Bello Horizonte	1910-1912	Persons	767
	Argentine Republic			
357	Province of Buenos Aires	1895-1912	Persons	767
358	" " "	1895-1912	Males	768
359	" " "	1895-1912	Females	768
360	City of Buenos Aires	1882-1913	Persons	769
361	" " "	1896-1913	Males	769
362	" " "	1896-1913	Females	770
363	" " "	1907-1911	By Organs and Parts, according to Sex	770
364	Rosario de Santa Fé	1904-1913	Persons	771
365	" "	1904-1911	Males	771
366	" "	1904-1911	Females	771
367	Province of Tucumán	1901-1912	Persons	771
368	Santiago del Estero	1891-1913	Persons	772
369	Chile	1892-1912	Persons	772
370	Prov. of Santiago de Chile	1904-1912	Persons	773
371	City of Santiago de Chile	1898-1909	Persons	773
372	" " "	1898-1902	By Organs and Parts	773
373	Uruguay	1891-1913	Persons	774
374	"	1905-1912	Males	774
375	"	1905-1912	Females	774
376	"	1906-1910	By Organs and Parts, according to Sex	775
377	Montevideo	1903-1913	Persons	775
378	"	1907-1911	By Organs and Parts	775

APPENDIX G

Table 1
Mortality from Cancer in the Civilized World, 1908-1912

	Population	Deaths from Cancer	Rate per 100,000 Population
....	9,041,866	3,018	33.4
....	272,814,962	148,447	54.4
....	382,549,311	251,438	65.7
ısia	27,886,740	20,345	73.0
....	1,431,996,861	1,096,716	76.6
:al	2,124,289,740	1,519,964	71.6

ılation, 1911: 439,699,139.

Table 2
ality from Cancer, by Countries, 1901-1905 Compared with 1906-1910

	Rate per 100,000 Population 1901-1905	1906-1910	Percentage of Increase
....	33.7	43.3	28.5
y	53.9	66.5	23.4
1	84.8	99.7	17.6
....	51.3	60.1	17.2
....	33.4	39.0	16.8
....	55.2	63.6	15.2
....	68.5	78.8	15.0
....	54.0	62.0	14.8
an Commonwealth	62.5	70.3	12.5
....	44.4	49.8	12.2
y	39.1	43.6	11.5
....	92.1	102.7	11.5
Columbia	30.3	33.4	10.2
Empire	77.7	84.2	8.5
l and Wales	86.7	94.0	8.4
....	16.8	18.1	7.7
aland	67.4	72.1	7.0
States	67.9	72.6	6.9
·k*	129.1	137.3	6.4
....	97.8	103.5	5.8
....	74.7	78.3	4.8
*	102.2	104.5	2.2
....	94.9	96.6	1.8
ne Republic†	70.1	71.3	1.7
and	128.3	125.9	−1.1
al	67.7	74.3	9.7

ı only. †Province and city of Buenos Aires only.

Table 3
and Standardized Cancer Mortality Rates per 100,000 of Population Selected Countries, 1908-1912

	Crude Rate	Standardized Rate*		Crude Rate	Standardized Rate*
and	127.1	107.8	U. S. Reg. Area	74.7	73.9
....	113.8	104.9	Australia	74.3	76.2
....	106.4	92.6	Uruguay	65.5	98.8
and Wales.	97.6	89.5	Italy	65.2	53.5
....	97.4	75.5	Japan	64.3	58.5
....	81.2	61.9	Cuba	44.4	60.3

lardized on the basis of the standard million of England and Wales, 1901.

APPENDIX G

Table 4
Mortality from Cancer in Countries of Europe

	Population	Deaths from Cancer	Rate per 100,000 Population
Austria	141,462,903	113,221	80.0
Belgium	36,936,410	24,712	66.9
Channel Islands	208,900	227	108.7
Denmark	5,453,322	7,747	142.1
England and Wales	178,980,717	174,602	97.6
France	196,878,000	148,662	75.5
German Empire	318,876,524	277,710	87.1
Gibraltar	97,823	81	82.8
Greece	2,117,670	1,100	51.9
Holland	29,479,395	31,375	106.4
Hungary	104,006,496	47,347	45.5
Ireland	21,925,004	17,796	81.2
Isle of Man	261,530	339	129.6
Italy	171,995,665	112,087	65.2
Malta	1,056,196	512	48.5
Norway	11,774,100	11,461	97.4
Portugal	29,060,580	6,504	22.4
Roumania	6,410,450	3,940	61.5
Russia	8,624,796	7,812	90.6
Scotland	23,686,521	24,399	103.0
Serbia	13,876,836	1,669	12.0
Spain	97,705,000	51,135	52.3
Sweden	6,685,581	7,022	105.0
Switzerland	18,686,442	23,228	124.3
Turkey	5,750,000	2,001	34.8
Total	1,431,996,861	1,096,716	76.6

Population, 1911: 291,384,190.

NOTES TO TABLE 4

Austria	1908–1912
Belgium	1908–1912
Channel Islands	Guernsey, 1909–1913
Denmark	All cities, 1908–1912
England and Wales	1908–1912
France	1906–1910
German Empire	1908–1912
Gibraltar	1908–1912
Greece	12 cities, 1904–1908
Holland	1908–1912
Hungary	1908–1912
Ireland	1908–1912
Isle of Man	1908–1912
Italy	1908–1912
Malta	1908–1912
Norway	1908–1912
Portugal	1906–1910
Roumania	All cities, 1907–1911
Russia	Moscow, 1910–1912, Petrograd, with suburbs, 1911–1912
Scotland	1908–1912
Serbia	1905–1909
Spain	1908–1912
Sweden	All cities, 1907–1911
Switzerland	1908–1912
Turkey	Constantinople, 1908–1912

APPENDIX G

Table 5
Mortality from Cancer in Countries of Europe
1896-1910

	1896-1900			1901-1905		
	Population	Deaths from Cancer	Rate per 100,000 Population	Population	Deaths from Cancer	Rate per 100,000 Population
and and Wales	157,609,380	126,206	80.1	166,489,397	144,351	86.7
land..........	21,725,362	16,753	77.1	22,676,880	19,223	84.8
nd...........	22,561,358	13,100	58.1	22,106,804	15,148	68.5
vay..........	10,769,800	9,234	85.7	11,314,400	10,732	94.9
mark*........	4,477,360	5,325	118.9	4,923,381	6,357	129.1
nan Empire...	254,148,664	179,863	70.8	280,410,950	217,866	77.7
and..........	25,166,349	23,134	91.9	26,840,255	26,239	97.8
zerland.......	16,127,599	20,544	127.4	17,142,770	21,995	128.3
ria...........	127,026,960	87,570	68.9	133,230,624	99,542	74.7
gary.........	75,364,810†	23,134†	30.7	98,225,662	38,366	39.1
....	159,631,670	81,332	50.9	164,281,879	90,757	55.2
ice*..........	65,951,116	64,185	97.3	70,461,200	64,865	92.1
Total........	940,560,428	650,380	69.1	1,018,154,202	755,441	74.2

	1906-1910		
	Population	Deaths from Cancer	Rate per 100,000 Population
England and Wales.	175,333,013	164,790	94.0
Scotland..........	23,394,061	23,316	99.7
Ireland...........	21,942,708	17,299	78.8
Norway..........	11,606,600	11,213	96.6
Denmark*........	5,288,066	7,259	137.3
German Empire...	310,481,457	261,311	84.2
Holland..........	28,725,355	29,727	103.5
Switzerland.......	18,237,395	22,963	125.9
Austria...........	139,193,082	108,947	78.3
Hungary.........	102,167,372	44,550	43.6
Italy.............	169,120,165	107,575	63.6
France*..........	71,714,000	73,643	102.7
Total........	1,077,203,274	872,593	81.0

Tote: From 1896-1900 to 1901-1905 the cancer mortality increased 5.05 per 100,000 pulation, or 7.3 per cent. From 1901-1905 to 1906-1910 it increased 6.81 per 100,000 pulation, or 9.2 per cent.

Cities only. †Four years only (1897-1900).

Table 6

Mortality from Cancer in England and Wales

1881-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	26,046,142	13,542	52.0
1882	26,334,942	14,057	53.4
1883	26,626,949	14,614	54.9
1884	26,922,192	15,198	56.5
1885	27,220,706	15,560	57.2
1881-1885	133,150,931	72,971	54.8
1886	27,522,532	16,243	59.0
1887	27,827,706	17,113	61.5
1888	28,136,258	17,506	62.2
1889	28,448,239	18,654	65.6
1890	28,763,673	19,433	67.6
1886-1890	140,698,408	88,949	63.2
1891	29,085,819	20,117	69.2
1892	29,421,392	20,353	69.2
1893	29,760,842	21,135	71.0
1894	30,104,201	21,422	71.2
1895	30,451,528	22,945	75.3
1891-1895	148,823,782	105,972	71.2
1896	30,802,858	23,521	76.4
1897	31,158,245	24,443	78.4
1898	31,517,725	25,196	79.9
1899	31,881,365	26,325	82.6
1900	32,249,187	26,721	82.9
1896-1900	157,609,380	126,206	80.1
1901	32,612,134	27,487	84.3
1902	32,951,455	27,872	84.6
1903	33,294,308	29,089	87.4
1904	33,640,736	29,682	88.2
1905	33,990,764	30,221	88.9
1901-1905	166,489,397	144,351	86.7
1906	34,344,429	31,668	92.2
1907	34,701,776	31,745	91.5
1908	35,062,847	32,717	93.3
1909	35,427,672	34,053	96.1
1910	35,796,289	34,607	96.7
1906-1910	175,333,013	164,790	94.0
1911	36,162,646	35,902	99.3
1912	36,531,263	37,323	102.2
1913	36,919,339	38,939	105.5

Source: Annual Reports of the Registrar-General of Births, Deaths and Marriages in England and Wales.

Table 7

Mortality from Cancer in England and Wales, Males

1881-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	12,673,435	4,611	36.4
1882	12,808,460	4,685	36.6
1883	12,944,923	4,967	38.4
1884	13,082,837	5,346	40.9
1885	13,222,216	5,495	41.6
1881-1885	64,731,871	25,104	38.8
1886	13,363,079	5,754	43.1
1887	13,505,441	6,262	46.4
1888	13,649,314	6,284	46.0
1889	13,794,721	6,891	50.0
1890	13,941,671	7,137	51.2
1886-1890	68,254,226	32,328	47.4
1891	14,092,535	7,294	51.8
1892	14,252,190	7,547	53.0
1893	14,413,657	7,908	54.9
1894	14,576,948	8,077	55.4
1895	14,742,091	8,628	58.5
1891-1895	72,077,421	39,454	54.7
1896	14,909,104	9,216	61.8
1897	15,078,010	9,573	63.5
1898	15,248,823	9,932	65.1
1899	15,421,578	10,337	67.0
1900	15,596,283	10,475	67.2
1896-1900	76,253,798	49,533	65.0
1901	15,769,478	10,891	69.1
1902	15,933,989	11,098	69.6
1903	16,100,211	11,799	73.3
1904	16,268,166	12,086	74.3
1905	16,437,866	12,470	75.9
1901-1905	80,509,710	58,344	72.5
1906	16,609,330	13,257	79.8
1907	16,782,579	13,199	78.6
1908	16,957,634	13,901	82.0
1909	17,134,508	14,263	83.2
1910	17,313,221	14,843	85.7
1906-1910	84,797,272	69,463	81.9
1911	17,490,286	15,589	89.1
1912	17,668,999	16,188	91.6
1913	17,857,014	16,918	94.7

Source: Annual Reports of the Registrar-General of Births, Deaths and Marriages in England and Wales.

Table 8

ity from Cancer in England and Wales, Females

1881-1913

Population	Deaths from Cancer	Rate per 100,000 Population
13,372,707	8,931	66.8
13,526,482	9,372	69.3
13,682,026	9,647	70.5
13,839,355	9,852	71.2
13,998,490	10,065	71.9
68,419,060	47,867	70.0
14,159,453	10,489	74.1
14,322,265	10,851	75.8
14,486,944	11,222	77.5
14,653,518	11,763	80.3
14,822,002	12,296	83.0
72,444,182	56,621	78.2
14,993,284	12,823	85.5
15,169,202	12,806	84.4
15,347,185	13,227	86.2
15,527,253	13,345	85.9
15,709,437	14,317	91.1
76,746,361	66,518	86.7
15,893,754	14,305	90.0
16,080,235	14,870	92.5
16,268,902	15,264	93.8
16,459,787	15,988	97.1
16,652,904	16,246	97.6
81,355,582	76,673	94.2
16,842,656	16,596	98.5
17,017,466	16,774	98.6
17,194,097	17,290	100.6
17,372,570	17,596	101.3
17,552,898	17,751	101.1
85,979,687	86,007	100.0
17,735,099	18,411	103.8
17,919,197	18,546	103.5
18,105,213	18,816	103.9
18,293,164	19,790	108.2
18,483,068	19,764	106.9
90,535,741	95,327	105.3
18,672,360	20,313	108.8
18,862,264	21,135	112.0
19,062,325	22,021	115.5

Annual Reports of the Regis-ral of Births, Deaths and Mar-England and Wales.

Table 9

Mortality from Cancer in England and Wales, according to Age and Sex

1901-1910

TOTAL

Ages	Population	Deaths from Cancer	Rate per 100,000 Population
Under 35	227,920,310	12,595	5.5
35-44	43,957,297	27,992	63.7
45-54	31,966,672	62,287	194.8
55-64	21,101,120	87,997	417.0
65-74	12,099,817	80,605	666.2
75-84	4,217,306	33,557	795.7
85 and over	559,888	4,108	733.7
All ages	341,822,410	309,141	90.4
MALES			
Under 35	111,499,560	5,465	4.9
35-44	21,222,110	8,773	41.3
45-54	15,363,631	23,779	154.8
55-64	9,911,807	38,675	390.2
65-74	5,367,518	35,831	667.6
75-84	1,739,029	13,810	794.1
85 and over	203,327	1,474	724.9
All ages	165,306,982	127,807	77.3
FEMALES			
Under 35	116,420,750	7,130	6.1
35-44	22,735,187	19,219	84.5
45-54	16,603,041	38,508	231.9
55-64	11,189,313	49,322	440.8
65-74	6,732,299	44,774	665.1
75-84	2,478,277	19,747	796.8
85 and over	356,561	2,634	738.7
All ages	176,515,428	181,334	102.7

Source: Annual Reports of the Registrar-General of Births, Deaths and Marriages in England and Wales.

APPENDIX G

Table 10

Mortality from Cancer in England and Wales, by Organs and Parts according to Sex, 1908-1912

Organ or Part	MALES Deaths from Cancer	MALES Rate per 100,000 Population	FEMALES Deaths from Cancer	FEMALES Rate per 100,000 Population
Lips	1,134	1.3	105	0.1
Tongue	4,278	4.9	400	0.4
Mouth	1,493	1.7	221	0.2
Jaw	2,149	2.5	726	0.8
Pharynx	1,438	1.7	406	0.4
Œsophagus	5,298	6.1	1,707	1.8
Stomach	15,780	18.2	14,437	15.6
Liver and gall-bladder	8,406	9.7	12,571	13.6
Peritoneum and mesentery	676	0.8	1,452	1.6
Intestines	6,985	8.1	9,581	10.4
Rectum	7,452	8.6	6,018	6.5
Pancreas	1,486	1.7	1,462	1.6
Ovaries and fallopian tube	..	..	2,221	2.4
Uterus	..	..	19,673	21.3
Breast	118	0.1	17,189	18.6
Skin	2,076	2.4	1,332	1.4
Larynx	1,662	1.9	486	0.5
Lungs and pleura	1,193	1.4	855	0.9
Kidneys and suprarenal glands	774	0.9	766	0.8
Bladder	2,245	2.6	978	1.1
Prostate	1,665	1.9	..	..
Brain	546	0.6	420	0.5
Other organs	6,696	7.7	5,770	6.2
Not specified	1,234	1.4	1,042	1.1
All organs	74,784	86.4	99,818	108.0

Males, 45 years and over, 20.57 per cent. of population. Females, 45 years and over, 22.10 per cent. of population.

Source: Annual Reports of the Registrar-General of Births, Deaths and Marriages in England and Wales.

APPENDIX G

Table 11

lity from Cancer in England and Wales, by Organs and Parts, Males 1897-1900 Compared with 1901-1910

Organ or Part	1897-1900 Deaths from Cancer	1897-1900 Rate per 100,000 Population	1901-1910 Deaths from Cancer	1901-1910 Rate per 100,000 Population	Percentage of Increase
....	997	1.63	2,945	1.78	9.2
....	647	1.05	2,001	1.21	15.2
....	508	0.83	2,241	1.36	63.9
:........................	2,124	3.46	7,092	4.29	24.0
....	1,071	1.75	3,697	2.24	28.0
atic glands of neck.......	1,084	1.77	3,585	2.17	22.6
ıx and throat............	891	1.45	2,967	1.79	23.4
:........................	740	1.21	2,518	1.52	25.6
....	536	0.87	1,688	1.02	17.2
agus...................	2,358	3.84	8,406	5.09	32.6
:h.......................	8,369	13.64	27,324	16.53	21.2
as.......................	550	0.90	2,391	1.45	61.1
nd gall-bladder..........	5,532	9.02	15,823	9.57	6.1
n........................	3,672	5.99	12,963	7.84	30.9
ntestines................	2,734	4.46	10,583	6.40	43.5
ıeum...................	395	0.64	1,076	0.65	1.6
'........................	405	0.66	1,381	0.84	27.3
r and urethra............	1,189	1.94	3,960	2.40	23.7
....	79	0.13	236	0.14	7.7
enerative organs.........	1,015	1.65	3,815	2.31	40.0
organs..................	3,566	5.81	9,930	5.99	3.1
ecified..................	1,855	3.02	1,185	0.72	—76.2
ans	40,317	65.72	127,807	77.31	17.6

ırce: Annual Reports of the Registrar-General of Births, Deaths and Marriages land and Wales.

APPENDIX G

Table 12
Mortality from Cancer in England and Wales, by Organs and Parts, Females 1897-1900 Compared with 1901-1910

Organ or Part	1897-1900 Deaths from Cancer	1897-1900 Rate per 100,000 Population	1901-1910 Deaths from Cancer	1901-1910 Rate per 100,000 Population	Percentage of Increase
Skin	608	0.93	2,053	1.16	24.7
Lips	74	0.11	169	0.10	−9.1
Mouth	115	0.18	370	0.21	16.7
Tongue	271	0.41	854	0.48	17.1
Jaw	397	0.61	1,335	0.76	24.6
Lymphatic glands of neck	405.	0.62	1,102	0.62	0.0
Pharynx and throat	334	0.51	831	0.47	−7.8
Larynx	282	0.43	834	0.47	9.3
Lungs	363	0.55	1,317	0.75	36.4
Œsophagus	852	1.30	2,804	1.59	22.3
Stomach	8,355	12.76	25,814	14.62	14.6
Pancreas	529	0.81	2,268	1.28	58.0
Liver and gall-bladder	8,654	13.22	24,021	13.61	3.0
Rectum	3,240	4.95	10,819	6.13	23.8
Other intestines	3,597	5.50	14,342	8.13	47.8
Peritoneum	1,050	1.60	2,634	1.49	−6.9
Kidney	446	0.68	1,411	0.80	17.6
Bladder and urethra	539	0.82	1,688	0.96	17.1
Breast	9,790	14.96	30,493	17.27	15.4
Uterus	14,309	21.86	39,562	22.41	2.5
Ovary	1,053	1.61	3,617	2.05	27.3
Other organs	4,248	6.49	11,378	6.45	−0.6
Not specified	2,857	4.36	1,628	0.92	−78.9
All organs	62,368	95.27	181,334	102.73	7.8

Source: Annual Reports of the Registrar-General of Births, Deaths and Marriages in England and Wales.

APPENDIX G

Table 13
Mortality from Cancer in England and Wales
Relative Cancer Mortality of Females, by Organs and Parts
1901-1910

Organ or Part	Rate per 100,000 Population Males	Females	Relative Mortality of Females
Breast	0.14	17.27	12,336
Generative organs	2.31	24.46	1,059
Peritoneum	0.65	1.49	229
Liver and gall-bladder	9.57	13.61	142
Other intestines	6.40	8.13	127
Kidney	0.84	0.80	95
Stomach	16.53	14.62	88
Pancreas	1.45	1.28	88
Rectum	7.84	6.13	78
Lungs	1.02	0.75	74
Skin	1.78	1.16	65
Bladder and urethra	2.40	0.96	40
Jaw	2.24	0.76	34
Œsophagus	5.09	1.59	31
Larynx	1.52	0.47	31
Lymphatic glands of neck	2.17	0.62	29
Pharynx and throat	1.79	0.47	26
Mouth	1.36	0.21	15
Tongue	4.29	0.48	11
Lips	1.21	0.10	8
All organs	77.31	102.73	133

Note: In this table the mortality of males from cancer of any organ or part is taken as 100 and the corresponding mortality of females is given accordingly.

Table 14
Mortality from Cancer of the Female Breast in England and Wales
1903-1912

Year	Female Population	Deaths from Cancer of the Breast	Rate per 100,000 Population
1903	17,194,097	2,948	17.1
1904	17,372,570	2,997	17.3
1905	17,552,898	2,944	16.8
1906	17,735,099	2,997	16.9
1907	17,919,197	3,162	17.6
1903-1907	87,773,861	15,048	17.1
1908	18,105,213	3,221	17.8
1909	18,293,164	3,377	18.5
1910	18,483,068	3,428	18.5
1911	18,672,360	3,427	18.4
1912	18,862,264	3,736	19.8
1908-1912	92,416,069	17,189	18.6

Source: Annual Reports of the Registrar-General of Births, Deaths and Marriages, in England and Wales.

APPENDIX G

Table 15

Comparative Mortality from Cancer in England and Wales, Urban and Rural, by Organs and Parts, according to Sex, 1911-1912

Organ or Part	Urban: Deaths from Cancer	Urban: Rate per 100,000 Population	Rural: Deaths from Cancer	Rural: Rate per 100,000 Population
TOTAL				
Buccal cavity	3,677	6.5	971	6.1
Stomach and liver	18,831	33.2	5,981	37.5
Peritoneum, intestines, rectum	10,733	18.9	3,401	21.3
Female generative organs	7,527	13.3	1,667	10.5
Breast	5,647	9.9	1,558	9.8
Skin	1,345	2.4	507	3.2
Other or not specified	8,983	15.8	2,397	15.0
All organs	56,743	100.0	16,482	103.4
MALES				
Buccal cavity	3,186	11.7	826	10.4
Stomach and liver	9,784	36.0	3,070	38.6
Peritoneum, intestines, rectum	4,934	18.1	1,692	21.2
Breast	32	0.1	10	0.1
Skin	850	3.1	313	3.9
Other or not specified	5,594	20.6	1,486	18.7
All organs	24,380	89.6	7,397	92.9
FEMALES				
Buccal cavity	491	1.7	145	1.8
Stomach and liver	9,047	30.6	2,911	36.5
Peritoneum, intestines, rectum	5,799	19.6	1,709	21.4
Generative organs	7,527	25.5	1,667	20.9
Breast	5,615	19.0	1,548	19.4
Skin	495	1.7	194	2.4
Other or not specified	3,389	11.4	911	11.4
All organs	32,363	109.5	9,085	113.9

POPULATION, 1911-1912

	Urban	Rural
Males	27,195,707	7,963,578
Females	29,562,270	7,972,354
Total	56,757,977	15,935,932

Source: Annual Reports of the Registrar-General of Births, Deaths and Marriages in England and Wales.

Note: If standardized, the urban cancer death rates are somewhat higher than the rural rates.

APPENDIX G

Table 15a
Cancer of the Ovary, according to Age and Conjugal Condition England and Wales, 1911-1913

	Death Rate per 100,000 of Population		Excess in Rates		Relative Rates Ages 25-29 Taken as 100	
Ages	Unmarried	Married or Widowed	Unmarried	Married or Widowed	Unmarried	Married or Widowed
25–29.......	0.9	0.7	0.2	..	100	100
30–34.......	1.4	1.0	0.4	..	156	143
35–39.......	3.7	2.1	1.6	..	411	300
40–44.......	7.6	3.5	4.1	..	844	500
45–49.......	14.2	5.9	8.3	..	1,578	843
50–54.......	15.0	8.3	6.7	..	1,667	1,186
55–59.......	21.8	8.6	13.2	..	2,422	1,229
60–64.......	13.7	9.7	4.0	..	1,522	1,386
65–69.......	17.4	10.5	6.9	..	1,933	1,500
70–74.......	17.8	9.4	8.4	..	1,978	1,343
75–79.......	21.1	9.0	12.1	..	2,344	1,286
80–84.......	3.1	6.0	..	2.9	344	857
85 and over..	6.3	4.6	1.7	..	700	657
15 and over..	6.0*	3.1*	2.9	..	667	443

Source: Seventy-sixth Annual Report of the Registrar-General of Births, Deaths and Marriages in England and Wales.

*Standardized to a million of persons aged 15 years and upwards, 1901.

Table 15b
Cancer of the Uterus, according to Age and Conjugal Condition England and Wales, 1911-1913

	Death Rate per 100,000 of Population		Excess in Rates		Relative Rates Ages 25-29 Taken as 100	
Ages	Unmarried	Married or Widowed	Unmarried	Married or Widowed	Unmarried	Married or Widowed
25–29.......	0.7	2.0	..	1.3	100	100
30–34.......	3.1	6.8	..	3.7	443	340
35–39.......	5.0	18.7	..	13.7	714	935
40–44.......	17.2	37.4	..	20.2	2,457	1,870
45–49.......	25.0	58.1	..	33.1	3,571	2,905
50–54.......	39.7	77.3	..	37.6	5,671	3,865
55–59.......	61.3	87.3	..	26.0	8,757	4,365
60–64.......	61.1	96.7	..	35.6	8,729	4,835
65–69.......	64.6	97.0	..	32.4	9,229	4,850
70–74.......	62.7	91.7	..	29.0	8,957	4,585
75–79........	84.4	92.8	..	8.4	12,057	4,640
80–84.......	102.0	73.0	29.0	..	14,571	3,650
85 and over..	50.4	58.4	..	8.0	7,200	2,920
15 and over..	16.9*	29.3*	..	12.4	2,414	1,465

Source: Seventy-sixth Annual Report of the Registrar-General of Births, Deaths and Marriages in England and Wales.

*Standardized to a million of persons aged 15 years and upwards, 1901.

Table 15c

Cancer of the Breast, according to Age and Conjugal Condition England and Wales, 1911-1913

	Death Rate per 100,000 of Population		Excess in Rates		Relative Rates Ages 25-29 Taken as 100	
Ages	Unmarried	Married or Widowed	Unmarried	Married or Widowed	Unmarried	Married or Widowed
25–29.......	0.4	0.7	..	0.3	100	100
30–34.......	3.2	4.1	..	0.9	800	586
35–39.......	12.9	12.6	0.3	..	3,225	1,800
40–44.......	29.9	26.8	3.1	..	7,475	3,829
45–49.......	55.0	41.8	13.2	..	13,750	5,971
50–54.......	75.5	51.7	23.8	..	18,875	7,386
55–59.......	102.3	65.7	36.6	..	25,575	9,386
60–64.......	118.9	73.7	45.2	..	29,725	10,529
65–69.......	142.3	81.2	61.1	..	35,575	11,600
70–74.......	180.6	111.7	68.9	..	45,150	15,957
75–79.......	200.5	134.6	65.9	..	50,125	19,229
80–84.......	225.6	156.2	69.4	..	56,400	22,314
85 and over..	308.8	191.6	117.2	..	77,200	27,371
15 and over..	34.6*	23.8*	10.8	..	8,650	3,400

Source: Seventy-sixth Annual Report of the Registrar-General of Births, Deaths and Marriages in England and Wales.

*Standardized to a million of persons aged 15 years and upwards, 1901.

Table 15d

Mortality from Cancer, Fistula and Gangrene in the City of London 1649-1758

	Deaths from All Causes	Deaths from Cancer, Fistula and Gangrene	Per Cent. of All Causes
1649-1658	117,344	370	0.32
1659-1668*	132,972	466	0.35
1669-1678	188,015	478	0.25
1679-1688	221,446	597	0.27
1701-1708	168,191	549	0.33
1709-1718	231,714	702	0.30
1719-1728	272,240	710	0.26
1729-1738	265,165	564	0.21
1739-1748	260,517	498	0.19
1749-1758	214,406	460	0.21

Source: A Collection of the Yearly Bills of Mortality from 1657 to 1758, London, 1759.

Note: No data available for 1689-1700.

*Data for 1665 and 1666 excluded, Plague years.

Table 16

tality from Cancer in London

1881-1913

	Population	Deaths from Cancer	Rate per 100,000 Population
1	3,840,239	2,332	60.7
2	3,880,005	2,461	63.4
3	3,919,771	2,561	65.3
4	3,959,537	2,604	65.8
5	3,999,303	2,622	65.6
885	19,598,855	12,580	64.2
6	4,039,069	2,688	66.5
7	4,078,835	2,909	71.3
8	4,118,601	2,932	71.2
9	4,158,367	3,029	72.8
0	4,198,133	3,286	78.3
890	20,593,005	14,844	72.1
1	4,237,896	3,342	78.9
2	4,268,727	3,246	76.0
3	4,299,558	3,462	80.5
4	4,330,389	3,523	81.4
5	4,361,220	3,705	85.0
895	21,497,790	17,278	80.4
6	4,392,051	3,856	87.8
7	4,422,882	3,963	89.6
8	4,453,713	4,133	92.8
9	4,484,544	4,293	95.7
0	4,515,375	4,348	96.3
900	22,268,565	20,593	92.5
1	4,546,209	4,260	93.7
2	4,544,878	4,591	101.0
3	4,543,547	4,716	103.8
4	4,542,216	4,677	103.0
5	4,540,885	4,691	103.3
905	22,717,735	22,935	101.0
6	4,539,554	5,001	110.2
7	4,538,223	4,899	107.9
8	4,536,892	5,045	111.2
9	4,535,561	5,128	113.1
0	4,534,230	5,115	112.8
910	22,684,460	25,188	111.0
1	4,532,899	4,858	107.2
2	4,531,572	5,176	114.2
3	4,530,245	5,260	114.9

ce: Annual Reports of the Registrar-
l of Births, Deaths and Marriages
land and Wales. Annual Report of
ndon County Counsel, 1913.

Table 17

Mortality from Cancer in London

Males

1881-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	1,808,753	755	41.7
1882	1,828,258	779	42.6
1883	1,847,388	804	43.5
1884	1,866,922	915	49.0
1885	1,886,072	909	48.2
1881-1885	9,237,393	4,162	45.1
1886	1,905,633	967	50.7
1887	1,925,618	1,089	56.6
1888	1,945,215	1,058	54.4
1889	1,964,828	1,078	54.9
1890	1,984,038	1,194	60.2
1886-1890	9,725,332	5,386	55.4
1891	2,003,253	1,233	61.5
1892	2,017,400	1,242	61.6
1893	2,031,541	1,280	63.0
1894	2,046,109	1,354	66.2
1895	2,060,240	1,423	69.1
1891-1895	10,158,543	6,532	64.3
1896	2,074,366	1,523	73.4
1897	2,088,485	1,617	77.4
1898	2,102,598	1,658	78.9
1899	2,116,705	1,741	82.3
1900	2,130,805	1,790	84.0
1896-1900	10,512,959	8,329	79.2
1901	2,145,356	1,704	79.4
1902	2,144,274	1,932	90.1
1903	2,142,737	2,000	93.3
1904	2,141,201	1,988	92.8
1905	2,139,665	1,986	92.8
1901-1905	10,713,233	9,610	89.7
1906	2,138,130	2,196	102.7
1907	2,137,049	2,184	102.2
1908	2,135,515	2,253	105.5
1909	2,134,435	2,261	105.9
1910	2,132,902	2,340	109.7
1906-1910	10,678,031	11,234	105.2
1911	2,131,822	2,265	106.2
1912	2,130,745	2,272	106.6
1913	2,129,668	2,318	108.8

Source: Annual Reports of the Registrar-General of Births, Deaths and Marriages in England and Wales.

APPENDIX G

Table 18
Mortality from Cancer in London, Females
1881-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	2,031,486	1,577	77.6
1882	2,051,747	1,682	82.0
1883	2,072,383	1,757	84.8
1884	2,092,615	1,689	80.7
1885	2,113,231	1,713	81.1
1881-1885	10,361,462	8,418	81.2
1886	2,133,436	1,721	80.7
1887	2,153,217	1,820	84.5
1888	2,173,386	1,874	86.2
1889	2,193,539	1,951	88.9
1890	2,214,095	2,092	94.5
1886-1890	10,867,673	9,458	87.0
1891	2,234,643	2,109	94.4
1892	2,251,327	2,004	89.0
1893	2,268,017	2,182	96.2
1894	2,284,280	2,169	95.0
1895	2,300,980	2,282	99.2
1891-1895	11,339,247	10,746	94.8
1896	2,317,685	2,333	100.7
1897	2,334,397	2,346	100.5
1898	2,351,115	2,475	105.3
1899	2,367,839	2,552	107.8
1900	2,384,570	2,558	107.3
1896-1900	11,755,606	12,264	104.3
1901	2,400,853	2,556	106.5
1902	2,400,604	2,659	110.8
1903	2,400,810	2,716	113.1
1904	2,401,015	2,689	112.0
1905	2,401,220	2,705	112.7
1901-1905	12,004,502	13,325	111.0

Year	Population	Deaths from Cancer	Rate p 100,0 Populat
1906	2,401,424	2,805	116
1907	2,401,174	2,715	113
1908	2,401,377	2,792	116
1909	2,401,126	2,867	119
1910	2,401,328	2,775	115
1906-1910	12,006,429	13,954	116
1911	2,401,077	2,593	10
1912	2,400,827	2,904	121
1913	2,400,577	2,942	12

Source: Annual Reports of the Regist General of Births, Deaths and Marria in England and Wales.

APPENDIX G

Table 19
Mortality from Cancer in Sheffield
1887-1913

	Population	Deaths from Cancer	Rate per 100,000 Population
	308,730	146	47.3
	312,793	135	43.2
	316,901	163	51.4
	321,079	156	48.6
0	1,259,503	600	47.6
	325,547	150	46.1
	330,816	154	46.6
	336,171	184	54.7
	341,612	207	60.6
	347,141	208	59.9
5	1,681,287	903	53.7
	352,760	225	63.8
	358,470	233	65.0
	364,272	244	67.0
	370,168	228	61.6
	376,160	284	75.5
0	1,821,830	1,214	66.6

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	410,151	255	62.2
1902	414,506	300	72.4
1903	418,906	303	72.3
.1904	423,355	317	74.9
1905	427,850	290	67.8
1901-1905	2,094,768	1,465	69.9
1906	432,395	346	80.0
1907	436,986	363	83.1
1908	441,630	347	78.6
1909	446,321	403	90.3
1910	451,065	394	87.3
1906-1910	2,208,397	1,853	83.9
1911	455,817	379	83.1
1912	466,408	371	79.5
1913	471,662	419	88.8

Source: Annual Reports of the Health of the City of Sheffield.

Table 20
Mortality from Cancer in Sheffield, Males
1887-1913

	Population	Deaths from Cancer	Rate per 100,000 Population
	153,871	43	27.9
	155,896	42	26.9
	157,943	56	35.5
	160,026	52	32.5
0	627,736	193	30.7
	162,253	58	35.7
	164,879	64	38.8
	167,548	57	34.0
	170,259	79	46.4
	173,015	76	43.9
95	837,954	334	39.9
	175,816	84	47.8
	178,661	96	53.7
	181,553	81	44.6
	184,492	96	52.0
	187,478	114	60.8
00	908,000	471	51.9

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	204,419	121	59.2
1902	206,590	115	55.7
1903	208,573	127	60.9
1904	210,577	137	65.1
1905	212,599	108	50.8
1901-1905	1,042,758	608	58.3
1906	214,641	155	72.2
1907	216,701	151	69.7
1908	218,784	162	74.0
1909	220,884	167	75.6
1910	223,007	172	77.1
1906-1910	1,094,017	807	73.8
1911	225,037	179	79.5
1912	230,266	177	76.9
1913	232,860	172	73.9

Source: Annual Reports of the Health of the City of Sheffield.

APPENDIX G

Table 21
Mortality from Cancer in Sheffield, Females
1887-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1887	154,859	103	66.5
1888	156,897	93	59.3
1889	158,958	107	67.3
1890	161,053	104	64.6
1887-1890	631,767	407	64.4
1891	163,294	92	56.3
1892	165,937	90	54.2
1893	168,623	127	75.3
1894	171,353	128	74.7
1895	174,126	132	75.8
1891-1895	843,333	569	67.5
1896	176,944	141	79.7
1897	179,809	137	76.2
1898	182,719	163	89.2
1899	185,676	132	71.1
1900	188,682	170	90.1
1896-1900	913,830	743	81.3
1901	205,732	134	65.1
1902	207,916	185	89.0
1903	210,333	176	83.7
1904	212,778	180	84.6
1905	215,251	182	84.6
1901-1905	1,052,010	857	81.5
1906	217,754	191	87.7
1907	220,285	212	96.2
1908	222,846	185	83.0
1909	225,437	236	104.7
1910	228,058	222	97.3
1906-1910	1,114,380	1,046	93.9
1911	230,780	200	86.7
1912	236,142	194	82.2
1913	238,802	247	103.4

Source: Annual Reports of the Health of the City of Sheffield.

Table 22
Mortality from Cancer in Liverpool
1889-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1889	523,838	291	55.6
1890	520,466	334	64.2
1891	518,302	346	66.8
1892	519,590	303	58.3
1893	520,882	341	65.5
1894	522,178	345	66.1
1895	652,523	502	76.9
1891-1895	2,733,475	1,837	67.2
1896	658,050	495	75.2
1897	663,633	514	77.5
1898	669,243	495	74.0
1899	674,912	530	78.5
1900	680,628	526	77.3
1896-1900	3,346,466	2,560	76.5
1901	686,332	593	86.4
1902	707,027	613	86.7
1903	710,874	661	93.0
1904	714,743	546	76.4
1905	721,864	620	85.9
1901-1905	3,540,840	3,033	85.7
1906	726,100	678	93.4
1907	730,361	684	93.7
1908	734,648	658	89.6
1909	738,960	694	93.9
1910	743,295	745	100.2
1906-1910	3,673,364	3,459	94.2
1911	747,627	726	97.1
1912	752,021	769	102.3
1913	756,553	717	94.8

Source: Annual Reports on the Health of the City of Liverpool.

APPENDIX G

Table 23
Mortality from Cancer in Liverpool, Males
1889-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1889	254,166	121	47.6
1890	252,478	122	48.3
1891	251,376	135	53.7
1892	251,897	122	48.4
1893	252,419	124	49.1
1894	252,943	136	53.8
1895	315,886	215	68.1
1891-1895	1,324,521	732	55.3
1896	318,430	203	63.8
1897	320,999	190	59.2
1898	323,579	210	64.9
1899	326,185	222	68.1
1900	328,811	187	56.9
1896-1900	1,618,004	1,012	62.5
1901	331,361	246	74.2
1902	341,070	258	75.6
1903	342,712	269	78.5
1904	344,363	235	68.2
1905	347,578	278	80.0
1901-1905	1,707,084	1,286	75.3
1906	349,399	282	80.7
1907	351,231	280	79.7
1908	353,072	298	84.4
1909	354,922	287	80.9
1910	356,782	342	95.9
1906-1910	1,765,406	1,489	84.3
1911	358,637	329	91.7
1912	360,519	371	102.9
1913	362,470	347	95.7

Source: Annual Reports on the Health of the City of Liverpool.

Table 24
Mortality from Cancer in Liverpool, Females
1889-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1889	269,672	170	63.0
1890	267,988	212	79.1
1891	266,926	211	79.0
1892	267,693	181	67.6
1893	268,463	217	80.8
1894	269,235	209	77.6
1895	336,637	287	85.3
1891-1895	1,408,954	1,105	78.4
1896	339,620	292	86.0
1897	342,634	324	94.6
1898	345,664	285	82.5
1899	348,727	308	88.3
1900	351,817	339	96.4
1896-1900	1,728,462	1,548	89.6
1901	354,971	347	97.8
1902	365,957	355	97.0
1903	368,162	392	106.5
1904	370,380	311	84.0
1905	374,286	342	91.4
1901-1905	1,833,756	1,747	95.3
1906	376,701	396	105.1
1907	379,130	404	106.6
1908	381,576	360	94.3
1909	384,038	407	106.0
1910	386,513	403	104.3
1906-1910	1,907,958	1,970	103.3
1911	388,990	397	102.1
1912	391,502	398	101.7
1913	394,083	370	93.9

Source: Annual Reports on the Health of the City of Liverpool.

APPENDIX G

Table 25
Mortality from Cancer in Birmingham
1891-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	479,193	324	67.6
1892	483,526	293	60.6
1893	487,897	313	64.2
1894	492,301	303	61.5
1895	496,751	332	66.8
1891-1895	2,439,668	1,565	64.1
1896	501,241	346	69.0
1897	505,772	376	74.3
1898	510,343	342	67.0
1899	514,956	386	75.0
1900	519,610	368	70.8
1896-1900	2,551,922	1,818	71.2
1901	522,270	395	75.6
1902	522,533	383	73.3
1903	522,796	413	79.0
1904	523,059	400	76.5
1905	523,323	437	83.5
1901-1905	2,613,981	2,028	77.6

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	523,586	460	87.9
1907	523,850	419	80.0
1908	524,114	441	84.1
1909	524,378	424	80.9
1910	525,762	469	89.2
1906-1910	2,621,690	2,213	84.4
1911	526,030	467	88.8
1912	850,947	792	93.1

Source: Annual Reports of the Medical Officer of Health for Birmingham.

Table 26
Mortality from Cancer in Birmingham, by Sex
1904-1912

MALES				FEMALES			
Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1904	252,481	172	68.1	1904	270,578	228	84.3
1905	252,608	186	73.6	1905	270,715	251	92.7
1906	252,735	210	83.1	1906	270,851	250	92.3
1907	252,862	168	66.4	1907	270,988	251	92.6
1908	252,990	193	76.3	1908	271,124	248	91.5
1909	253,117	170	67.2	1909	271,261	254	93.6
1910	253,785	236	93.0	1910	271,977	233	85.7
1906-1910	1,265,489	977	77.2	1906-1910	1,356,201	1,236	91.1
1911	253,915	184	72.5	1911	272,115	283	104.0
1912	405,646	349	86.0	1912	445,301	443	99.5

Source: Annual Reports of the Medical Officer of Health for Birmingham.

APPENDIX G

Table 27
Mortality from Cancer in Leeds
1893-1913

	Population	Deaths from Cancer	Rate per 100,000 Population
	381,157	229	60.1
	387,259	265	68.4
	393,387	299	76.0
	399,535	308	77.1
	405,716	308	75.9
	411,895	292	70.9
	418,101	317	75.8
	424,322	369	87.0
00	2,059,569	1,594	77.4
	429,383	348	81.0
	431,043	353	81.9
	432,703	406	93.8
	434,363	379	87.3
	436,023	444	101.8
05	2,163,515	1,930	89.2

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	437,683	432	98.7
1907	439,343	415	94.5
1908	441,003	463	105.0
1909	442,663	449	101.4
1910	444,323	447	100.6
1906-1910	2,205,015	2,206	100.0
1911	445,983	476	106.7
1912	447,746	473	105.6
1913	457,295	509	111.3

Source: Annual Reports made to the Urban Sanitary Authority of the City of Leeds.

Table 28
Mortality from Cancer in Bristol
1894-1913

	Population	Deaths from Cancer	Rate per 100,000 Population
	228,027	183	80.3
	231,026	208	90.0
	234,025	201	85.9
	237,024	212	89.4
	323,824	243	75.0
	327,825	289	88.2
	332,076	266	80.1
00	1,454,774	1,211	83.2
	339,042	259	76.4
	339,344	291	85.8
	339,646	281	82.7
	339,948	285	83.8
	353,693	313	88.5
05	1,711,673	1,429	83.5

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	354,329	307	86.6
1907	354,965	317	89.3
1908	355,601	306	86.1
1909	356,237	357	100.2
1910	356,873	340	95.3
1906-1910	1,778,005	1,627	91.5
1911	357,509	387	108.2
1912	359,400	402	111.9
1913	361,362	396	109.6

Source: Annual Reports of the Medical Officer of Health of Bristol.

Table 29

Mortality from Cancer in Manchester, 1891-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	508,673	321	63.1
1892	513,196	312	60.8
1893	517,760	303	58.5
1894	522,365	344	65.9
1895	527,010	334	63.4
1891-1895	2,589,004	1,614	62.3
1896	531,697	358	67.3
1897	536,426	396	73.8
1898	541,296	394	72.8
1899	546,010	408	74.7
1900	542,566	412	75.9
1896-1900	2,697,995	1,968	72.9
1901	546,408	425	77.8
1902	550,355	435	79.0
1903	554,331	424	76.5
1904	558,335	452	81.0
1905	631,933	546	86.4
1901-1905	2,841,362	2,282	80.3
1906	646,066	562	87.0
1907	660,199	498	75.4
1908	674,332	584	86.6
1909	688,466	606	88.0
1910	702,600	660	93.9
1906-1910	3,371,663	2,910	86.3
1911	716,734	750	104.6
1912	730,868	721	98.6

Source: Annual Reports on the Health of the City of Manchester.

Table 30

Mortality from Cancer in Manchester, Males 1891-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	245,486	119	48.5
1892	247,514	105	42.4
1893	249,612	121	48.5
1894	251,728	124	49.3
1895	253,861	116	45.7
1891-1895	1,248,201	585	46.9
1896	256,012	125	48.8
1897	258,081	152	58.9
1898	260,418	164	63.0
1899	262,576	144	54.8
1900	260,811	156	59.8
1896-1900	1,297,898	741	57.1
1901	262,549	180	68.6
1902	264,336	185	70.0
1903	268,352	185	68.9
1904	270,275	192	71.0
1905	303,067	238	78.5
1901-1905	1,368,579	980	71.6
1906	309,853	242	78.1
1907	316,631	206	65.1
1908	323,410	267	82.6
1909	330,188	266	80.6
1910	336,967	307	91.1
1906-1910	1,617,049	1,288	79.7
1911	344,490	332	96.4
1912	350,524	309	88.2

Source: Annual Reports on the Health of the City of Manchester.

Table 31

ality from Cancer in Manchester, Females
1891-1912

	Population	Deaths from Cancer	Rate per 100,000 Population
	263,187	202	76.8
	265,682	207	77.9
	268,148	182	67.9
	270,637	220	81.3
	273,149	218	79.8
'5	1,340,803	1,029	76.7
	275,685	233	84.5
	278,345	244	87.7
	280,878	230	81.9
	283,434	264	93.1
	281,755	256	90.9
'0	1,400,097	1,227	87.6
	283,859	245	86.3
	286,019	250	87.4
	285,979	239	83.6
	288,060	260	90.3
	328,866	308	93.7
'5	1,472,783	1,302	88.4
	336,213	320	95.2
	343,568	292	85.0
	350,922	317	90.3
	358,278	340	94.9
	365,633	353	96.5
0	1,754,614	1,622	92.4
	372,244	418	112.3
	380,344	412	108.3

': Annual Reports on the Health
ity of Manchester.

Table 32

Mortality from Cancer in Scotland
1881-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	3,742,564	1,914	51.1
1882	3,770,657	2,056	54.5
1883	3,798,961	2,037	53.6
1884	3,827,478	2,110	55.1
1885	3,856,207	2,173	56.4
1881-1885	18,995,867	10,290	54.2
1886	3,885,155	2,313	59.5
1887	3,914,318	2,373	60.6
1888	3,943,701	2,450	62.1
1889	3,973,305	2,643	66.5
1890	4,003,132	2,428	60.7
1886-1890	19,719,611	12,207	61.9
1891	4,036,245	2,703	67.0
1892	4,078,910	2,715	66.6
1893	4,122,029	2,816	68.3
1894	4,165,606	2,928	70.3
1895	4,209,645	2,993	71.1
1891-1895	20,612,435	14,155	68.7
1896	4,254,153	3,013	70.8
1897	4,299,132	3,212	74.7
1898	4,344,589	3,453	79.5
1899	4,390,530	3,572	81.4
1900	4,436,958	3,503	79.0
1896-1900	21,725,362	16,753	77.1
1901	4,479,065	3,662	81.8
1902	4,507,048	3,711	82.3
1903	4,535,201	3,798	83.7
1904	4,563,530	3,920	85.9
1905	4,592,036	4,132	90.0
1901-1905	22,676,880	19,223	84.8
1906	4,620,720	4,509	97.6
1907	4,649,586	4,551	97.9
1908	4,678,629	4,611	98.6
1909	4,707,858	4,782	101.6
1910	4,737,268	4,863	102.7
1906-1910	23,394,061	23,316	99.7
1911	4,766,678	4,948	103.8
1912	4,796,088	5,195	108.3

Source: Annual Reports of the Registrar-General on the Births, Deaths and Marriages registered in Scotland.

APPENDIX G

Table 33
Mortality from Cancer in Scotland, by Sex
1906-1912

MALES				FEMALES			
Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	2,241,049	1,785	79.7	1906	2,379,671	2,724	114.5
1907	2,255,049	1,786	79.2	1907	2,394,537	2,765	115.5
1908	2,269,135	1,816	80.0	1908	2,409,494	2,795	116.0
1909	2,283,311	1,887	82.6	1909	2,424,547	2,895	119.4
1910	2,297,575	1,953	85.0	1910	2,439,693	2,910	119.3
1906-1910	11,346,119	9,227	81.3	1906-1910	12,047,942	14,089	116.9
1911	2,311,839	2,046	88.5	1911	2,454,839	2,902	118.2
1912	2,326,103	2,075	89.2	1912	2,469,985	3,120	126.3

Source: Annual Reports of the Registrar-General on the Births, Deaths and Marriages registered in Scotland.

Table 34
Mortality from Cancer in Scotland, by Organs and Parts, according to Sex
1906-1910

Organ or Part	MALES		FEMALES	
	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population
Lips	125	1.10	16	0.13
Mouth	97	0.85	26	0.22
Tongue	457	4.03	63	0.52
Jaw	278	2.45	88	0.73
Pharynx and throat	200	1.76	73	0.61
Larynx	154	1.36	58	0.48
Lungs	151	1.33	121	1.00
Œsophagus	354	3.12	183	1.52
Stomach	2,471	21.78	2,769	22.98
Pancreas	131	1.15	165	1.37
Liver	985	8.68	1,655	13.74
Rectum	651	5.74	630	5.23
Other intestines	1,102	9.71	1,708	14.18
Peritoneum	82	0.72	176	1.46
Kidney	86	0.76	88	0.73
Bladder and urethra	227	2.00	124	1.03
Breast	18	0.16	1,856	15.41
Male generative organs	234	2.06	..	..
Uterus	..	..	2,262	18.77
Ovary	..	..	217	1.80
Other organs	1,138	10.03	1,388	11.52
Not specified	286	2.52	423	3.51
All organs	9,227	81.32	14,089	116.94

Source: Detailed Annual Reports of the Registrar-General of Births, Deaths and Marriages in Scotland.

APPENDIX G

Table 35
Mortality from Cancer in Scotland
Relative Mortality of Females, by Organs and Parts
1906-1910

;an or Part	Rate per 100,000 Population Males	Rate per 100,000 Population Females	Relative Mortality of Females
....	0.16	15.41	9,631
tive organs...........................	2.06	20.57	999
ıeum..................................	0.72	1.46	203
....	8.68	13.74	158
ntestines.............................	9.71	14.18	146
as....................................	1.15	1.37	119
:h....................................	21.78	22.98	106
'.....................................	0.76	0.73	96
ı.....................................	5.74	5.23	91
....	1.33	1.00	75
r and urethra.........................	2.00	1.03	52
agus..................................	3.12	1.52	49
ıx and throat.........................	1.76	0.61	35
:.....................................	1.36	0.48	35
....	2.45	0.73	30
....	0.85	0.22	26
:.....................................	4.03	0.52	13
....	1.10	0.13	12
ıns...................................	81.32	116.94	144

e: In this table the mortality of males from cancer of any organ or part is taken ınd the corresponding mortality of females is given accordingly.

Table 36
Mortality from Cancer in Aberdeen
1899-1913

	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
)	151,425	145	95.8	1906	158,698	141	88.8
)	152,464	132	86.6	1907	159,737	181	113.3
				1908	160,776	178	110.7
l	153,503	146	95.1	1909	161,815	182	112.5
2	154,542	138	89.3	1910	162,854	161	98.9
3	155,581	133	85.5				
4	156,620	163	104.1	1906-1910	803,880	843	104.9
5	157,659	145	92.0				
				1911	163,891	201	122.6
905	777,905	725	93.2	1912	164,932	219	132.8
				1913	165,073	237	143.6

Source: Annual Reports by the Medical Officer of Health for Aberdeen.

APPENDIX G

Table 37
Mortality from Cancer in the City of Edinburgh
1898-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1898	301,305	267	88.6
1899	305,468	276	90.4
1900	309,688	297	95.9
1901	316,921	293	92.5
1902	317,880	312	98.2
1903	318,219	316	99.3
1904	318,560	331	103.9
1905	318,777	344	107.9
1901-1905	1,590,357	1,596	100.4
1906	319,120	330	103.4
1907	319,464	344	107.7
1908	319,809	353	110.4
1909	320,282	373	116.5
1910	320,504	387	120.7
1906-1910	1,599,179	1,787	111.7
1911	320,829	405	126.2
1912	321,119	400	124.6
1913	321,645	401	124.7

Source: Annual Reports of the Public Health Department of the City of Edinburgh.

Table 38
Mortality from Cancer in the City of Edinburgh, Males
1898-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1898	137,696	104	75.5
1899	139,477	112	80.3
1900	141,280	116	82.1
1901	144,421	110	76.2
1902	144,635	127	87.8
1903	144,567	130	89.9
1904	144,499	125	86.5
1905	144,374	124	85.9
1901-1905	722,496	616	85.3
1906	144,210	132	91.5
1907	144,110	120	83.3
1908	144,010	123	85.4
1909	143,967	130	90.3
1910	143,810	167	116.1
1906-1910	720,107	672	93.3
1911	143,667	154	107.2
1912	144,118	139	96.4
1913	144,354	146	101.1

Source: Annual Reports of the Public Health Department of the City of Edinburgh.

APPENDIX G

Table 39
Mortality from Cancer in the City of Edinburgh, Females
1898-1913

	Population	Deaths from Cancer	Rate per 100,000 Population
	163,609	163	99.6
	165,991	164	98.8
	168,408	181	107.5
	172,500	183	106.1
	173,245	185	106.8
	173,652	186	107.1
	174,061	206	118.3
	174,403	220	126.1
)5	867,861	980	112.9

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	174,910	198	113.2
1907	175,354	224	127.7
1908	175,799	230	130.8
1909	176,315	243	137.8
1910	176,694	220	124.5
1906-1910	879,072	1,115	126.8
1911	177,162	251	141.7
1912	177,001	261	147.5
1913	177,291	255	143.8

Source: Annual Reports of the Public Health Department of the City of Edinburgh.

Table 40
Mortality from Cancer in Glasgow
1881-1913

	Population	Deaths from Cancer	Rate per 100,000 Population
	511,914	239	46.7
	513,915	252	49.0
	515,924	236	45.7
	517,941	274	52.9
	519,965	266	51.2
85	2,579,659	1,267	49.1
	521,999	270	51.7
	524,039	275	52.5
	526,088	287	54.6
	555,811	337	60.6
	561,561	314	55.9
90	2,689,498	1,483	55.1
	567,272	339	59.8
	669,059	410	61.3
	677,883	437	64.5
	686,820	472	68.7
	695,876	462	66.4
95	3,296,910	2,120	64.3
	705,052	470	66.7
	714,919	521	72.9
	724,349	525	72.5
	742,194	612	82.5
	753,494	565	75.0
00	3,640,008	2,693	74.0

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	775,594	571	73.6
1902	776,484	649	83.6
1903	777,374	624	80.3
1904	778,264	650	83.5
1905	779,154	693	86.9
1901-1905	3,886,870	3,187	82.0
1906	780,044	803*	102.9
1907	780,934	818*	104.7
1908	781,824	801*	102.5
1909	782,714	840*	107.3
1910	783,605	896*	114.3
1906-1910	3,909,121	4,158*	106.4
1911	784,496	809	103.1
1912	785,600	844	107.4
1913	1,029,478	971	94.3

Source: Annual Reports of the Registrar-General on the Births, Deaths and Marriages registered in Scotland.

1881-1908, Communications Statistiques publiées par le Bureau Municipal de Statistique d'Amsterdam, No. 33.

*Deaths of non-residents included, 1906-1910.

APPENDIX G

Table 41
Mortality from Cancer in Ireland
1881-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	5,145,770	1,909	37.1
1882	5,101,018	1,882	36.9
1883	5,023,811	1,995	39.7
1884	4,974,561	1,947	39.1
1885	4,938,588	1,925	39.0
1881-1885	25,183,748	9,658	38.4
1886	4,905,895	2,029	41.4
1887	4,857,119	2,067	42.6
1888	4,801,312	2,003	41.7
1889	4,757,385	2,134	44.9
1890	4,717,959	2,145	45.5
1886-1890	24,039,670	10,378	43.2
1891	4,680,376	2,163	46.2
1892	4,633,808	2,221	47.9
1893	4,607,462	2,280	49.5
1894	4,589,260	2,375	51.8
1895	4,559,936	2,296	50.4
1891-1895	23,070,842	11,335	49.1
1896	4,542,061	2,437	53.7
1897	4,529,917	2,635	58.2
1898	4,518,478	2,657	58.8
1899	4,502,401	2,654	58.9
1900	4,468,501	2,717	60.8
1896-1900	22,561,358	13,100	58.1
1901	4,447,085	2,893	65.1
1902	4,434,551	2,861	64.5
1903	4,417,757	3,048	69.0
1904	4,408,103	3,055	69.3
1905	4,399,308	3,291	74.8
1901-1905	22,106,804	15,148	68.5
1906	4,397,571	3,481	
1907	4,388,451	3,338	
1908	4,384,664	3,314	
1909	4,386,601	3,502	
1910	4,385,421	3,664	
1906-1910	21,942,708	17,299	
1911	4,383,608	3,582	
1912	4,384,710	3,734	

Source: Detailed Annual Reports Registrar-General for Ireland on riages, Births and Deaths.

APPENDIX G

Table 42
Mortality from Cancer in Ireland, Males
1893-1912

r	Population	Deaths from Cancer	Rate per 100,000 Population
3	2,268,440	1,052	46.4
4	2,259,919	1,066	47.2
5	2,247,303	995	44.3
6	2,239,138	1,100	49.1
7	2,234,205	1,214	54.3
8	2,229,701	1,238	55.5
9	2,221,965	1,193	53.7
0	2,204,921	1,212	55.0
1900	11,129,930	5,957	53.5
1	2,196,182	1,296	59.0
2	2,193,561	1,286	58.6
3	2,189,440	1,350	61.7
4	2,188,276	1,376	62.9
5	2,186,577	1,443	66.0
1905	10,954,036	6,751	61.6

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	2,186,778	1,566	71.6
1907	2,183,051	1,530	70.1
1908	2,184,127	1,527	69.9
1909	2,187,792	1,631	74.6
1910	2,188,271	1,712	78.2
1906-1910	10,930,019	7,966	72.9
1911	2,188,155	1,778	81.3
1912	2,189,429	1,768	80.8

Source: Detailed Annual Reports of the Registrar-General for Ireland on Marriages, Births and Deaths.

Table 43
Mortality from Cancer in Ireland, Females
1893-1912

r	Population	Deaths from Cancer	Rate per 100,000 Population
3	2,339,022	1,228	52.5
4	2,329,341	1,309	56.2
5	2,312,633	1,301	56.3
6	2,302,923	1,337	58.1
7	2,295,712	1,421	61.9
8	2,288,777	1,419	62.0
9	2,280,436	1,461	64.1
0	2,263,580	1,505	66.5
1900	11,431,428	7,143	62.5
1	2,250,903	1,597	70.9
2	2,240,990	1,575	70.3
3	2,228,317	1,698	76.2
4	2,219,827	1,679	75.6
5	2,212,731	1,848	83.5
1905	11,152,768	8,397	75.3

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	2,210,793	1,915	86.6
1907	2,205,400	1,808	82.0
1908	2,200,537	1,787	81.2
1909	2,198,809	1,871	85.1
1910	2,197,150	1,952	88.8
1906-1910	11,012,689	9,333	84.7
1911	2,195,453	1,804	82.2
1912	2,195,281	1,966	89.6

Source: Detailed Annual Reports of the Registrar-General for Ireland on Marriages, Births and Deaths.

APPENDIX G

Table 44
Mortality from Cancer in Ireland, by Provinces and Counties
1901-1910

County	Population	Deaths from Cancer	Rate per 100,000 Population
Antrim	1,949,770	1,753	89.9
Belfast County Borough	3,680,630	2,713	73.7
Down	2,050,960	1,912	93.2
Armagh	1,228,420	1,332	108.4
Londonderry	1,425,150	1,382	97.0
Tyrone	1,466,160	1,326	90.4
Monaghan	730,330	603	82.6
Donegal	1,711,290	1,205	70.4
Fermanagh	636,330	456	71.7
Cavan	943,570	584	61.9
Total for Ulster	15,822,610	13,266	83.8
Louth	647,420	598	92.4
Meath	662,940	573	86.4
Dublin	1,649,810	1,576	95.5
Dublin County Borough	2,977,200	3,002	100.8
Kildare	650,970	501	77.0
Wicklow	607,680	497	81.8
Carlow	370,000	296	80.0
Wexford	1,031,880	720	69.8
Kilkenny	770,610	432	56.1
Queens	560,230	375	66.9
Kings	585,090	413	70.6
Westmeath	608,070	446	73.3
Longford	452,470	231	51.1
Total for Leinster	11,574,370	9,660	83.5
Leitrim	664,620	388	58.4
Sligo	815,640	426	52.2
Roscommon	978,730	475	48.5
Mayo	1,956,720	828	42.3
Galway	1,873,870	953	50.9
Total for Connaught	6,289,580	3,070	48.8
Waterford	855,760	645	75.4
Cork	3,983,580	2,743	68.9
Tipperary, S. R.	909,850	680	74.7
Tipperary, N. R.	653,480	369	56.5
Limerick	1,445,830	861	59.6
Clare	1,082,830	557	51.4
Kerry	1,627,080	596	36.6
Total for Munster	10,558,410	6,451	61.1
Total for Ireland	44,244,970	32,447	73.3

Source: Supplement to the Forty-seventh Report of the Registrar-General of Marriages, Births and Deaths in Ireland for the years 1901-1910.

APPENDIX G

Table 45
Mortality from Cancer in Ireland, by Organs and Parts according to Sex, 1901-1910

gan or Part	MALES Deaths from Cancer	MALES Rate per 100,000 Population	FEMALES Deaths from Cancer	FEMALES Rate per 100,000 Population
	158	0.7	86	0.4
	70	0.3	76	0.3
	156	0.7	44	0.2
:	733	3.3	127	0.6
x	494	2.3	144	0.6
agus	456	2.1	235	1.1
h	4,271	19.5	3,771	17.0
ies	878	4.0	1,026	4.6
1	986	4.5	744	3.4
nd gall-bladder	1,682	7.7	2,336	10.5
as	119	0.5	137	0.6
of neck	606	2.8	289	1.3
and bladder	255	1.2	145	0.7
e	117	0.5	..	..
enerative organs	178	0.8	..	..
	..	..	260	1.2
	..	..	2,319	10.5
	65	0.3	2,957	13.3
g	403	1.8	545	2.5
	573	2.6	204	0.9
	588	2.7	482	2.2
	672	3.1	122	0.6
organs	750	3.4	833	3.8
ied	372	1.8	708	3.1
ecified	135	0.6	140	0.6
ans	14,717	67.2	17,730	80.0

rce: Supplement to the Forty-seventh Report of the Registrar-General of Mar- Births and Deaths in Ireland, containing Decennial Summaries for the years 1901-

APPENDIX G

Table 46
Mortality from Cancer in Ireland, by Age and Sex
1901-1910

Ages	Population	Deaths from Cancer	Rate per 100,000 Population
MALES			
Under 25	10,992,361	237	2.2
25–34	3,153,492	328	10.4
35–44	2,525,420	1,014	40.2
45–54	1,956,435	2,519	128.8
55–64	1,529,695	4,269	279.1
65–74	1,197,058	4,357	364.0
75 and over	529,594	1,993	376.3
All ages	21,884,055	14,717	67.2
FEMALES			
Under 25	10,761,329	205	1.9
25–34	3,280,488	566	17.3
35–44	2,549,028	1,939	76.1
45–54	2,063,604	3,868	187.4
55–64	1,624,728	5,177	318.6
65–74	1,316,628	4,137	314.2
75 and over	569,652	1,838	322.7
All ages	22,165,457	17,730	80.0

Source: Supplement to the Forty-seventh Report of the Registrar-General of Marriages, Births and Deaths in Ireland, containing Decennial Summaries for the years 1901-1910.

APPENDIX G

Table 47

Mortality from Cancer in Ireland, by Organs and Parts and Duration of Illness, Males

1901

an or Part	6 Mos. and Under	6 Mos. to 1 Year	1 Year to 2 Years	2 Years to 3 Years	Over 3 Years	Total Cases of Known Duration	Duration Not Given	Grand Total
Number of Deaths by Duration of Illness								
d nose.......	10	12	19	5	12	58	9	67
....	9	24	7	2	1	43	5	48
....	3	17	20	9	9	58	5	63
:.............	11	24	8	2	..	45	3	48
x and throat..	13	15	8	..	2	38	6	44
agus.........	9	18	1	..	..	28	1	29
h...........	136	120	64	4	3	327	63	390
1............	14	28	28	4	2	76	13	89
ntestines......	19	14	11	1	2	47	21	68
nd gall-bladder	72	37	16	4	1	130	25	155
of the neck....	15	29	3	2	..	49	12	61
or not specified ns...........	58	63	44	12	8	185	49	234
ns...........	369	401	229	45	40	1,084	212	1,296
Percentage of Distribution of Cases with Known Duration								
d nose.......	17.2	20.7	32.8	8.6	20.7	100.0		
....	20.9	55.8	16.3	4.7	2.3	100.0		
....	5.2	29.3	34.5	15.5	15.5	100.0		
:.............	24.5	53.3	17.8	4.4	..	100.0		
x and throat..	34.2	39.5	21.0	..	5.3	100.0		
agus.........	32.1	64.3	3.6	..	..	100.0		
h............	41.6	36.7	19.6	1.2	0.9	100.0		
1............	18.4	36.8	36.8	5.3	2.7	100.0		
ntestines......	40.4	29.8	23.4	2.1	4.3	100.0		
nd gall-bladder	55.4	28.4	12.3	3.1	0.8	100.0		
of the neck....	30.6	59.2	6.1	4.1	..	100.0		
or not specified ns...........	31.3	34.1	23.8	6.5	4.3	100.0		
ns...........	34.0	37.0	21.1	4.2	3.7	100.0		

rce: Supplement to the Thirty-eighth Detailed Annual Report of the Registrar- of Marriages, Births and Deaths in Ireland.

APPENDIX G

Table 48

Mortality from Cancer in Ireland, by Organs and Parts and Duration of Illness, Females

1901

Organ or Part	6 Mos. and Under	6 Mos. to 1 Year	1 Year to 2 Years	2 Years to 3 Years	Over 3 Years	Total Cases of Known Duration	Duration Not Given	Grand Total
	Number of Deaths by Duration of Illness							
Face and nose	4	10	8	8	9	39	11	50
Jaw	7	4	2	1	1	15	3	18
Lips	2	2	4	1	1	10	1	11
Tongue	3	4	2	..	..	9	2	11
Pharynx and throat	3	6	..	..	..	9	3	12
Œsophagus	6	5	2	..	..	13	2	15
Stomach	123	109	67	11	5	315	48	363
Rectum	7	18	19	2	1	47	4	51
Other intestines	16	25	7	3	..	51	17	68
Liver and gall-bladder	90	52	19	..	1	162	29	191
Glands of the neck	10	2	4	1	..	17	3	20
Breast	26	75	87	25	18	231	34	265
Uterus	38	87	49	7	6	187	50	237
Other or not specified organs	72	73	50	14	14	223	62	285
All organs	407	472	320	73	56	1,328	269	1,597
	Percentage of Distribution of Cases with Known Duration							
Face and nose	10.3	25.6	20.5	20.5	23.1	100.0		
Jaw	46.6	26.7	13.3	6.7	6.7	100.0		
Lips	20.0	20.0	40.0	10.0	10.0	100.0		
Tongue	33.3	44.5	22.2	..	..	100.0		
Pharynx and throat	33.3	66.7	..	..	..	100.0		
Œsophagus	46.1	38.5	15.4	..	..	100.0		
Stomach	39.0	34.6	21.3	3.5	1.6	100.0		
Rectum	14.9	38.3	40.4	4.3	2.1	100.0		
Other intestines	31.4	49.0	13.7	5.9	..	100.0		
Liver and gall-bladder	55.6	32.1	11.7	..	0.6	100.0		
Glands of the neck	58.8	11.8	23.5	5.9	..	100.0		
Breast	11.2	32.5	37.7	10.8	7.8	100.0		
Uterus	20.3	46.5	26.2	3.8	3.2	100.0		
Other or not specified organs	32.3	32.7	22.4	6.3	6.3	100.0		
All organs	30.7	35.5	24.1	5.5	4.2	100.0		

Source: Supplement to the Thirty-eighth Detailed Annual Report of the Registrar-General of Marriages, Births and Deaths in Ireland.

APPENDIX G

Table 49
Mortality from Cancer in Dublin
1901-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	290,638	237	81.5
1902	292,054	251	85.9
1903	293,470	295	100.5
1904	294,886	280	95.0
1905	296,302	273	92.1
1901-1905	1,467,350	1,336	91.0
1906	297,718	306	102.8
1907	299,134	297	99.3
1908	300,550	314	104.5
1909	301,966	314	104.0
1910	303,382	369	121.6
1906-1910	1,502,750	1,600	106.5
1911	304,802	348	114.2
1912	306,218	356	116.3

Source: Detailed Annual Reports of the Registrar-General for Ireland on Marriages, Births and Deaths.
1906, Report on the State of Public Health in the City of Dublin.

Table 50
Mortality from Cancer in Belfast
1901-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	349,180	224	64.2
1902	352,956	218	61.8
1903	356,732	239	67.0
1904	360,509	245	68.0
1905	364,285	282	77.4
1901-1905	1,783,662	1,208	67.7
1906	368,062	261	70.9
1907	371,838	278	74.8
1908	375,615	304	80.9
1909	379,391	332	87.5
1910	383,168	330	86.1
1906-1910	1,878,074	1,505	80.1
1911	386,947	315	81.4
1912	390,724	331	84.7

Source: Detailed Annual Reports of the Registrar-General for Ireland on Marriages, Births and Deaths.

APPENDIX G

Table 51
Mortality from Cancer in the Isle of Man
1902-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1902	54,481	60	110.1
1903	54,210	62	114.4
1904	53,938	58	107.5
1905	53,666	72	134.2
1902-1905	216,295	252	116.5
1906	53,394	65	121.7
1907	53,122	59	111.1
1908	52,850	68	128.7
1909	52,578	68	129.3
1910	52,306	70	133.8
1906-1910	264,250	330	124.9
1911	52,034	80	153.7
1912	51,762	53	102.4
1913	51,490	87	169.0

Source: Annual Reports of the Registrar-General on Births, Deaths, Marriages and Vaccinations in the Isle of Man.

Table 52
Mortality from Cancer in the Isle of Man, Males
1902-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1902	25,345	24	94.7
1903	25,191	33	131.0
1904	25,038	27	107.8
1905	24,885	28	112.5
1902-1905	100,459	112	111.5
1906	24,732	33	133.4
1907	24,580	25	101.7
1908	24,422	31	126.8
1909	24,265	31	127.8
1910	24,108	39	161.8
1906-1910	122,107	159	130.2
1911	23,951	32	133.6
1912	23,811	21	88.2
1913	23,671	36	152.1

Source: Annual Reports of the Registrar-General on Births, Deaths, Marriages and Vaccinations in the Isle of Man.

APPENDIX G

Table 53
Mortality from Cancer in the Isle of Man, Females
1902-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1902	29,136	36	123.6
1903	29,019	29	99.9
1904	28,900	31	107.3
1905	28,781	44	152.9
1902-1905	115,836	140	120.9
1906	28,662	32	111.6
1907	28,542	34	119.1
1908	28,428	37	130.2
1909	28,313	37	130.7
1910	28,198	31	109.9
1906-1910	142,143	171	120.3
1911	28,083	48	170.9
1912	27,951	32	114.5
1913	27,819	51	183.3

Source: Annual Reports of the Registrar-General on Births, Deaths, Marriages and Vaccinations in the Isle of Man.

Table 54
Mortality from Cancer in Guernsey, Channel Islands
1900-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	40,200	34	84.6
1901	40,300	34	84.4
1902	40,475	40	98.8
1903	40,650	40	98.4
1904	40,795	39	95.6
1905	40,884	47	115.0
1901-1905	203,104	200	98.5
1906	40,990	48	117.1
1907	41,174	58	140.9
1908	41,350	46	111.2
1909	41,524	35	84.3
1910	41,670	47	112.8
1906-1910	206,708	234	113.2
1911	41,854	53	126.6
1912	41,900	44	105.0
1913	42,000	48	114.3

Source: Guernsey, Fifteenth Annual Report of the Medical Officer of Health for the year 1913.

APPENDIX G

Table 55
Mortality from Cancer in Gibraltar*
1900-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	20,230	21	103.8	1906	19,971	13	65.1
				1907	19,894	7	35.2
1901	20,355	18	88.4	1908	19,817	13	65.6
1902	20,279	16	78.9	1909	19,740	13	65.9
1903	20,202	5	24.8	1910	19,663	21	106.8
1904	20,125	12	59.6				
1905	20,048	14	69.8	1906-1910	99,085	67	67.6
1901-1905	101,009	65	64.4	1911	19,586	16	81.7
				1912	19,017	18	94.7
				1913	18,448	19	103.0

Source: Annual Reports of the Public Health of Gibraltar.

* The civil population only.

Table 56
Mortality from Cancer in Malta and Gozo
1896-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1896	175,486	76	43.3	1906	199,784	94	47.1
1897	176,976	87	49.2	1907	202,649	110	54.3
1898	178,466	78	43.7	1908	205,514	96	46.7
1899	179,956	86	47.8	1909	208,379	102	48.9
1900	182,594	88	48.2	1910	211,244	98	46.4
1896-1900	893,478	415	46.4	1906-1910	1,027,570	500	48.7
1901	185,459	98	52.8	1911	214,112	107	50.0
1902	188,324	87	46.2	1912	216,947	109	50.2
1903	191,189	89	46.6				
1904	194,054	107	55.1				
1905	196,919	76	38.6				
1901-1905	955,945	457	47.8				

Source: Malta, Annual Reports on the Public Health Department.

APPENDIX G

Table 57

Mortality from Cancer in Malta and Gozo, by Organs and Parts according to Sex, 1911-1913

Organ or Part	MALES Deaths from Cancer	MALES Rate per 100,000 Population	FEMALES Deaths from Cancer	FEMALES Rate per 100,000 Population
Buccal cavity	8	3.7	..	0.0
Stomach and liver	33	15.3	24	11.1
Peritoneum, intestines and rectum	6	2.8	10	4.6
Breast	..	..	23	10.6
Female generative organs	..	..	30	13.9
Skin	10	4.7	3	1.4
Other or not specified organs	41	19.1	23	10.7
All organs	98	45.6	113	52.3

Source: Malta, Reports on the Public Health Department, 1911-1912 and 1912-1913.
Note: Two fiscal years, ending March 31, 1913.

Table 58

Mortality from Cancer in Norway 1881-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881-1885	9,566,500	4,725	49.4
1886	1,943,900	984	50.6
1887	1,955,200	1,094	56.0
1888	1,961,800	1,091	55.6
1889	1,969,200	1,116	56.7
1890	1,981,600	1,131	57.1
1886-1890	9,811,700	5,416	55.2
1891	1,996,900	1,224	61.3
1892	2,010,000	1,278	63.6
1893	2,021,400	1,405	69.5
1894	2,039,800	1,449	71.0
1895	2,065,900	1,464	70.9
1891-1895	10,134,000	6,820	67.3
1896	2,094,100	1,691*	80.8
1897	2,123,700	1,802	84.9
1898	2,155,400	1,802†	83.6
1899	2,185,300	1,931	88.4
1900	2,211,300	2,008	90.8
1896-1900	10,769,800	9,234	85.7
1901	2,235,000	2,126	95.1
1902	2,254,600	2,064	91.5
1903	2,265,900	2,112	93.2
1904	2,274,500	2,182	95.9
1905	2,284,400	2,248	98.4
1901-1905	11,314,400	10,732	94.9
1906	2,293,800	2,239	97.6
1907	2,302,700	2,310	100.3
1908	2,318,400	2,252	97.1
1909	2,338,400	2,226	95.2
1910	2,353,300	2,186	92.9
1906-1910	11,606,600	11,213	96.6
1911	2,370,700	2,292	96.7
1912	2,393,300	2,505	104.8

Source: Norges officielle Statistik: Sundhedstilstanden og Medicinalforholdene. Statistisk Aarsbok for Kongeriket Norge.

*Two cases sex unknown. †One case sex unknown.

APPENDIX G

Table 59
Mortality from Cancer in Norway, Males
1896-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1896	1,014,374	835	82.3
1897	1,029,302	901	87.5
1898	1,045,266	931	89.1
1899	1,060,373	954	90.0
1900	1,073,604	989	92.1
1896-1900	5,222,919	4,610	88.3
1901	1,084,590	1,062	97.9
1902	1,093,576	1,026	93.8
1903	1,098,529	1,048	95.4
1904	1,102,170	1,091	99.0
1905	1,106,438	1,087	98.2
1901-1905	5,485,303	5,314	96.9
1906	1,110,458	1,106	99.6
1907	1,114,233	1,088	97.6
1908	1,121,292	1,095	97.7
1909	1,130,422	1,039	91.9
1910	1,137,079	1,069	94.0
1906-1910	5,613,484	5,397	96.1
1911	1,144,937	1,164	101.7
1912	1,155,057	1,265	109.7

Source: Norges officielle Statistik: Sundhedstilstanden og Medicinalforholdene. Statistisk Aarsbok for Kongeriket Norge.

Table 60
Mortality from Cancer in Norway, Females
1896-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1896	1,079,726	854	79.1
1897	1,094,398	901	82.3
1898	1,110,134	870	78.4
1899	1,124,927	977	86.9
1900	1,137,696	1,019	89.6
1896-1900	5,546,881	4,621	83.3
1901	1,150,410	1,064	92.5
1902	1,161,024	1,038	89.4
1903	1,167,371	1,064	91.1
1904	1,172,330	1,091	93.1
1905	1,177,962	1,161	98.6
1901-1905	5,829,097	5,418	92.9
1906	1,183,342	1,133	95.7
1907	1,188,467	1,222	102.8
1908	1,197,108	1,157	96.6
1909	1,207,978	1,187	98.3
1910	1,216,221	1,117	91.8
1906-1910	5,993,116	5,816	97.0
1911	1,225,763	1,128	92.0
1912	1,238,243	1,240	100.3

Source: Norges officielle Statistik: Sundhedstilstanden og Medicinalforholdene. Statistisk Aarsbok for Kongeriket Norge.

APPENDIX G

Table 61
Mortality from Cancer in Norway, by Organs and Parts according to Sex, 1896-1910

Organ or Part	MALES Deaths from Cancer	MALES Rate per 100,000 Population	FEMALES Deaths from Cancer	FEMALES Rate per 100,000 Population
Stomach	9,847	60.3	8,033	46.2
Liver	999	6.1	922	5.3
Breast	9	0.1	1,156	6.7
Generative organs	181	1.1	1,833	10.5
Other organs	2,925	17.9	2,651	15.3
Not specified	473	2.9	480	2.8
Sarcoma	887	5.5	780	4.5
All organs	15,321	93.9	15,855	91.3

Table 62
Mortality from Cancer in Norway
Relative Mortality of Females, by Organs and Parts, 1896-1910

Organ or Part	Rate per 100,000 Population: Males	Rate per 100,000 Population: Females	Relative Mortality of Females
Breast	0.06	6.66	11,100
Generative organs	1.11	10.55	950
Not specified	2.90	2.76	95
Liver	6.12	5.31	87
Other organs	17.92	15.26	85
Sarcoma	5.43	4.49	83
Stomach	60.33	46.25	77
All organs	93.87	91.28	97

Note: In this table the mortality of males from cancer of any organ or part is taken as 100 and the corresponding mortality of females is given accordingly.

Table 63
Mortality from Cancer in Norway, by Age and Sex 1896-1910

MALES

Age Groups	Population	Deaths from Cancer	Rate per 100,000 Population
Under 10	4,195,228	102	2.4
10-19	3,507,441	71	2.0
20-29	2,399,349	136	5.7
30-39	1,784,657	365	20.5
40-49	1,536,051	1,296	84.4
50-59	1,191,531	3,147	264.1
60-69	929,889	4,783	514.4
70-79	604,601	4,287	709.1
80-89	161,850	1,064	657.4
90 and over	11,109	53	477.1
Age unknown	..	17	..
All ages	16,321,706	15,321	93.9

FEMALES

Age Groups	Population	Deaths from Cancer	Rate per 100,000 Population
Under 10	4,029,369	55	1.4
10-19	3,406,113	67	2.0
20-29	2,672,077	154	5.8
30-39	2,134,539	630	29.5
40-49	1,773,387	1,938	109.3
50-59	1,355,950	3,379	249.2
60-69	1,058,502	4,337	409.7
70-79	710,312	3,956	556.9
80-89	209,724	1,251	596.5
90 and over	19,121	71	371.3
Age unknown	..	17	..
All ages	17,369,094	15,855	91.3

Source: Norges officielle Statistik: Sundhedstilstanden og Medicinalforholdene.

APPENDIX G

Table 64
Mortality from Cancer in Norway, by Organs and Parts according to Age, Males
1896-1910

Organ or Part	Under 30	30-39	40-49	50-59	60-69	70-79	80 and Over
	Deaths from Cancer						
Stomach	40	206	872	2,184	3,229	2,747	562
Liver	3	15	83	191	342	286	79
Breast	..	..	..	2	3	3	1
Generative organs	1	6	10	24	45	65	30
Other organs	40	55	201	524	823	920	352
Not specified	8	11	32	98	158	130	36
Sarcoma	217	72	98	124	183	136	57
	Rate per 100,000 Population						
Stomach	0.40	11.54	56.77	183.29	347.25	454.35	324.93
Liver	0.03	0.84	5.40	16.03	36.78	47.30	45.68
Breast	..	..	..	0.17	0.32	0.50	0.58
Generative organs	0.01	0.34	0.65	2.01	4.84	10.75	17.35
Other organs	0.40	3.08	13.09	43.98	88.51	152.17	203.52
Not specified	0.08	0.62	2.08	8.22	16.99	21.50	20.81
Sarcoma	2.15	4.03	6.38	10.41	19.68	22.49	32.96

Source: Norges officielle Statistik: Sundhedstilstanden og Medicinalforholdene.

Table 65
Mortality from Cancer in Norway, by Organs and Parts according to Age, Females
1896-1910

Organ or Part	Under 30	30-39	40-49	50-59	60-69	70-79	80 and Over
	Deaths from Cancer						
Stomach	37	220	780	1,677	2,429	2,257	627
Liver	6	23	96	202	254	245	94
Breast	8	77	247	292	268	180	83
Generative organs	28	144	409	490	405	263	91
Other organs	25	86	253	494	708	745	335
Not specified	7	20	55	97	137	124	40
Sarcoma	165	60	98	127	136	142	52
	Rate per 100,000 Population						
Stomach	0.37	10.31	43.98	123.68	229.48	317.75	273.98
Liver	0.06	1.08	5.41	14.90	24.00	34.49	41.08
Breast	0.08	3.61	13.93	21.53	25.32	25.34	36.27
Generative organs	0.28	6.75	23.06	36.14	38.26	37.03	39.76
Other organs	0.25	4.03	14.27	36.43	66.89	104.88	146.39
Not specified	0.07	0.94	3.10	7.15	12.94	17.46	17.48
Sarcoma	1.63	2.81	5.53	9.37	12.85	19.99	22.72

Source: Norges officielle Statistik: Sundhedstilstanden og Medicinalforholdene.

APPENDIX G

Table 66

Proportionate Mortality from Cancer in Norway, for Whole Country and for Cities, by Organs and Parts, according to Sex 1896-1901

	PERCENTAGE Whole Country			Cities		
Organ or Part	Males	Females	Total	Males	Females	Total
Stomach.............	66.9	52.9	60.0	64.0	45.6	54.0
Liver................	7.6	6.0	6.8	9.0	7.0	8.0
Breast...............	0.1	7.4	3.8	..	7.6	4.2
Generative organs.....	1.0	11.6	6.3	1.2	16.2	9.5
Other organs..........	24.4	22.1	23.1	25.8	23.6	24.3
All organs............	100.0	100.0	100.0	100.0	100.0	100.0

Source: Dr. Munch Soegaard: Die Krebs Formationen Norwegens. In: Zeitschrift für Krebsforschung, 1913.

Table 67

Proportionate Mortality from Cancer in Norway, by Organs and Parts and Geographical Divisions of Kingdom 1896-1907

	PERCENTAGE						
	Stomach	Liver	Breast	Male Gen. Organs	Female Gen. Organs	Other Organs	Not Specified
Southern Norway...	60.8	7.2	3.8	0.6	5.3	17.5	4.8
Interior Norway....	62.4	7.0	3.7	0.7	5.0	16.6	4.6
Western Norway....	62.3	5.5	3.8	0.6	5.9	18.4	3.5
Northern Norway...	68.6	5.2	3.2	0.6	4.8	14.8	2.8
Total..........	62.7	6.4	3.7	0.6	5.3	17.2	4.1
Cities alone.........	52.5	8.0	4.7	10.5		24.3	
Rural alone.........	67.6	5.6	3.2	3.7		19.9	

Source: Dr. Munch Soegaard: Die Krebs Formationen Norwegens. In: Zeitschrift für Krebsforschung, 1913.

Table 68

Mortality from Cancer in Kristiania 1896-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1896	192,174	182	94.7	1906	235,441	233	99.0
1897	199,616	186	93.2	1907	236,862	282	119.1
1898	207,058	151	72.9	1908	238,283	240	100.7
1899	215,481	155	71.9	1909	239,704	239	99.7
1900	223,577	185	82.7	1910	241,125	226	93.7
1896-1900	1,037,906	859	82.8	1906-1910	1,191,415	1,220	102.4
1901	228,336	222	97.2	1911	242,546	249	102.7
1902	229,757	204	88.8	1912	243,967	275	112.7
1903	231,178	189	81.8				
1904	232,599	247	106.2				
1905	234,020	240	102.6				
1901-1905	1,155,890	1,102	95.3				

Source. Norges officielle Statistik: 1896-1912. Sundhedstilstanden og Medicinalforholdene.

Table 69
Mortality from Cancer in Bergen 1896-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1896	63,895	64	100.2
1897	65,752	60	91.3
1898	67,609	69	102.1
1899	69,466	67	96.5
1900	71,323	64	89.7
1896-1900	338,045	324	95.8
1901	72,482	70	96.6
1902	72,944	76	104.2
1903	73,406	75	102.2
1904	73,868	81	109.7
1905	74,330	72	96.9
1901-1905	367,030	374	101.9
1906	74,792	84	112.3
1907	75,254	91	120.9
1908	75,716	68	89.8
1909	76,178	84	110.3
1910	76,640	65	84.8
1906-1910	378,580	392	103.5
1911	77,102	75	97.2
1912	77,464	84	108.4

Source: Norges officielle Statistik: 1896-1912. Sundhedstilstanden og Medicinalforholdene.

Table 70
Mortality from Cancer in the City of Hammerfest 1896-1911

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1896-1900	11,605	11	94.8
1901-1905	12,535	17	135.6
1906-1910	13,638	18	132.0
1911	2,862	4	139.8

Source: Norges officielle Statistik: 1896-1911. Sundhedstilstanden og Medicinalforholdene.

Note: Hammerfest is the nothernmost city of the world, 70° 40′ North Latitude.

Table 71
Mortality from Cancer in the Cities of Sweden, 1901-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	1,112,883	1,122	100.8
1902	1,129,913	1,141	101.0
1903	1,151,616	1,216	105.6
1904	1,175,625	1,169	99.4
1905	1,202,638	1,250	103.9
1901-1905	5,772,675	5,898	102.2
1906	1,243,496	1,221	98.2
1907	1,285,837	1,378	107.2
1908	1,313,513	1,370	104.3
1909	1,328,798	1,426	107.3
1910	1,354,850	1,422	105.0
1906-1910	6,526,494	6,817	104.5
1911	1,402,583	1,446	103.1
1912	1,422,903	1,436	100.9

Source: Statistisk Årsbok för Sverige, 1914.

Table 72
Mortality from Cancer in Sweden Cities and Rural, according to Sex 1911

	Population	Deaths from Cancer	Rate per 100,000 Population
CITIES			
Males.....	647,624	589	90.9
Females ..	754,959	857	113.5
Total...	1,402,583	1,446	103.1
RURAL			
Males.....	2,069,457	2,030	98.1
Females...	2,089,759	1,994	95.4
Total...	4,159,216	4,024	96.7
WHOLE COUNTRY			
Males.....	2,717,081	2,619	96.4
Females...	2,844,718	2,851	100.2
Total...	5,561,799	5,470	98.3

Source: Sveriges officiella Statistik: Dödsfallsstatistik, 1911.

APPENDIX G

Table 73
Cancer Census of Sweden, by Provinces and Sex
1905

Province	Cases of Cancer Total	Cases of Cancer Males	Cases of Cancer Females	Rate per 100,000 Population Total	Rate per 100,000 Population Males	Rate per 100,000 Population Females
us............	126	51	75	29.2	24.3	33.9
stad..........	55	24	31	25.0	22.4	27.5
'.............	52	23	29	35.0	31.1	38.8
....	33	11	22	23.0	15.9	29.7
rg...........	40	20	20	25.4	25.8	25.0
ıg...........	48	17	31	23.3	16.9	29.3
....	69	25	44	24.6	18.5	30.3
g and Bohus...	180	77	103	50.4	44.9	55.5
....	44	18	26	19.4	16.2	22.4
l............	23	8	15	43.1	31.9	53.8
ı Sweden......	670	274	396	29.9	25.1	34.3
land..........	91	32	59	31.7	23.0	39.8
rg............	42	23	19	17.6	19.8	15.4
.nland........	57	23	34	33.6	27.4	39.7
....	60	22	38	30.0	22.3	37.4
m (city)......	239	68	171	73.7	46.2	96.5
lm (rural).....	77	28	49	40.0	29.4	50.5
....	42	18	24	33.4	29.6	37.0
ıland.........	52	21	31	34.9	28.5	41.1
d............	90	36	54	35.3	29.0	41.2
entral.........	750	271	479	38.3	28.6	47.3
g.............	66	24	42	26.8	19.7	33.8
›erg..........	80	35	45	35.7	31.4	40.0
d.............	35	13	22	30.9	22.5	39.7
lorrland.......	84	35	49	34.9	29.2	40.5
entral.........	265	107	158	32.0	25.9	38.1
›tten..........	31	16	15	20.3	20.8	19.8
ten...........	38	23	15	25.3	31.2	20.4
. Sweden.......	69	39	30	23.0	25.6	20.3
r Sweden......	1,754	691	1,063	33.1	26.7	39.2
one...........	689.	217	472	56.7	38.7	72.0
stricts........	1,065	474	591	26.1	23.4	28.8

e: Zeitschrift für Krebsforschung, 7. Band.

APPENDIX G

Table 74

Cancer Census of Sweden, by Organs and Parts Urban and Rural, 1905, Males

Organ or Part	Cases of Cancer: Cities	Cases of Cancer: Rural Districts	Percentage of All Cases: Cities	Percentage of All Cases: Rural Districts
Lips	2	48	0.9	10.1
Tongue	8	6	3.7	1.3
Mouth	1	4	0.5	0.8
Jaw	3	5	1.4	1.1
Pharynx	1	2	0.5	0.4
Larynx	1	..	0.5	..
Thyroid gland	..	..	..	..
Lungs	3	1	1.4	0.2
Breast	2	3	0.9	0.6
Œsophagus	20	12	9.2	2.5
Stomach	108	294	49.8	62.0
Intestines	29	37	13.4	7.8
Liver	4	7	1.8	1.5
Pancreas	7	3	3.2	0.6
Peritoneum	..	2	..	0.4
Kidney and bladder	4	8	1.8	1.7
Prostate	2	6	0.9	1.3
Penis	4	8	1.8	1.7
Cancer cutis	18	28	8.3	6.0
All organs	217	474	100.0	100.0

Source: Zeitschrift für Krebsforschung, 7. Band.

Table 75

Cancer Census of Sweden, by Organs and Parts Urban and Rural, 1905, Females

Organ or Part	Cases of Cancer: Cities	Cases of Cancer: Rural Districts	Percentage of All Cases: Cities	Percentage of All Cases: Rural Districts
Lips	2	11	0.4	1.9
Tongue	1	9	0.2	1.5
Mouth	2	3	0.4	0.5
Jaw	8	6	1.7	1.0
Pharynx	1	2	0.2	0.3
Larynx	..	..	0.0	0.0
Thyroid gland	2	..	0.4	0.0
Lungs	2	1	0.4	0.2
Breast	123	131	26.1	22.2
Œsophagus	11	11	2.3	1.9
Stomach	129	216	27.3	36.5
Intestines	39	50	8.3	8.5
Liver	4	5	0.8	0.8
Pancreas	2	2	0.4	0.3
Peritoneum	5	2	1.1	0.3
Kidney and bladder	5	4	1.1	0.7
Uterus	85	78	18.0	13.2
Ovaries	22	28	4.7	4.7
Vagina	7	8	1.5	1.4
Cancer cutis	22	24	4.7	4.1
All organs	472	591	100.0	100.0

Source: Zeitschrift für Krebsforschung, 7. Band.

Table 76
Mortality from Cancer Stockholm 1908-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1908	338,521	433	127.9
1909	340,689	426	125.0
1910	342,074	423	123.7
1911	344,461	349	101.3
1912	346,848	416	119.9
1908-1912	1,712,593	2,047	119.5
1913	379,128	477	125.8

Source: Sveriges officiella Statistik. Allmän Hälso- och Sjukvården för År 1908-1913.

Note: Includes only carcinoma.

Table 77
Mortality from Cancer Göteborg 1908-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1908	161,502	142	87.9
1909	163,218	161	98.6
1910	165,883	145	87.4
1911	169,208	156	92.2
1912	172,006	152	88.4
1908-1912	831,817	756	90.9
1913	175,967	154	87.5

Source: Göteborgs Hälsovårds Nämds Årsberättelse för 1912-1913.

Note: Includes only carcinoma.

Table 78
Mortality from Cancer in Cities of Denmark 1881-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	570,781	593	103.9
1882	588,067	606	103.0
1883	605,353	641	105.9
1884	622,639	686	110.2
1885	639,925	726	113.5
1881-1885	3,026,765	3,252	107.4
1886	657,211	722	109.9
1887	674,497	775	114.9
1888	691,783	782	113.0
1889	709,069	866	122.1
1890	726,355	832	114.5
1886-1890	3,458,915	3,977	115.0
1891	747,495	927	124.0
1892	768,636	837	108.9
1893	789,777	936	118.5
1894	810,918	875	107.9
1895	832,059	933	112.1
1891-1895	3,948,885	4,508	114.2
1896	853,190	1,022	119.8
1897	874,331	1,054	120.5
1898	895,472	1,063	118.7
1899	916,613	1,063	116.0
1900	937,754	1,123	119.8
1896-1900	4,477,360	5,325	118.9
1901	958,905	1,201	125.2
1902	971,790	1,276	131.3
1903	984,676	1,229	124.8
1904	997,562	1,313	131.6
1905	1,010,448	1,338	132.4
1901-1905	4,923,381	6,357	129.1
1906	1,023,334	1,344	131.3
1907	1,040,473	1,438	138.2
1908	1,057,613	1,415	133.8
1909	1,074,753	1,515	141.0
1910	1,091,893	1,547	141.7
1906-1910	5,288,066	7,259	137.3
1911	1,109,033	1,575	142.0
1912	1,120,030	1,695	151.3

Source: Dödsaarsagerne i Kongeriget Danmarks Byer.

Note: Deaths of rural patients in hospitals are excluded.

Table 79
Mortality from Cancer in Cities of Denmark, Males 1894-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1894	373,022	353	94.6
1895	382,747	362	94.6
1896	392,467	413	105.2
1897	402,192	437	108.7
1898	411,917	470	114.1
1899	421,642	431	102.2
1900	431,367	476	110.3
1896-1900	2,059,585	2,227	108.1
1901	441,096	505	114.5
1902	447,023	510	114.1
1903	452,951	518	114.4
1904	458,879	556	121.2
1905	464,806	557	119.8
1901-1905	2,264,755	2,646	116.8
1906	470,734	576	122.4
1907	478,618	596	124.5
1908	486,502	605	124.4
1909	494,386	663	134.1
1910	502,270	682	135.8
1906-1910	2,432,510	3,122	128.3
1911	509,285	654	128.4
1912	514,318	750	145.8

Source: Dödsaarsagerne i Kongeriget Danmarks Byer.
Note: Deaths of rural patients in hospitals are excluded.

Table 80
Mortality from Cancer in Cities of Denmark, Females 1894-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1894	437,896	522	119.2
1895	449,312	571	127.1
1896	460,723	609	132.2
1897	472,139	617	130.7
1898	483,555	593	122.6
1899	494,971	632	127.7
1900	506,387	647	127.8
1896-1900	2,417,775	3,098	128.1
1901	517,809	696	134.4
1902	524,767	766	146.0
1903	531,725	711	133.7
1904	538,683	757	140.5
1905	545,642	781	143.1
1901-1905	2,658,626	3,711	139.6
1906	552,600	768	139.0
1907	561,855	842	149.9
1908	571,111	810	141.8
1909	580,367	852	146.8
1910	589,623	865	146.7
1906-1910	2,855,556	4,137	144.9
1911	599,748	921	153.6
1912	605,712	945	156.0

Source: Dödsaarsagerne i Kongeriget Danmarks Byer.
Note: Deaths of rural patients in hospitals are excluded.

Table 81
Mortality from Cancer in the Cities of Denmark, by Organs and Parts according to Sex, 1908-1912

	MALES		FEMALES	
Organ or Part	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population
Stomach	1,362	54.3	1,327	45.0
Breast	..	..	750	25.5
Uterus	..	..	439	14.9
Other organs	1,992	79.5	1,877	63.7
All organs	3,354	133.8	4,393	149.1

Source: Dödsaarsagerne i Kongeriget Danmarks Byer.
Note: Deaths of rural patients in hospitals are excluded.

APPENDIX G

Table 82
Mortality from Cancer in Copenhagen, 1894-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1894	394,231	487	123.5
1895	402,836	513	127.3
1896	411,441	564	137.1
1897	420,046	562	133.8
1898	428,651	626	146.0
1899	437,256	598	136.8
1900	445,861	609	136.6
1896-1900	2,143,255	2,959	138.1
1901	454,466	668	147.0
1902	464,959	707	152.1
1903	475,452	700	147.2
1904	485,945	713	146.7
1905	496,438	770	155.1
1901-1905	2,377,260	3,558	149.7
1906	506,931	782	154.3
1907	517,424	853	164.9
1908	527,917	802	151.9
1909	538,410	839	155.8
1910	548,903	928	169.1
1906-1910	2,639,585	4,204	159.3
1911	559,398	883	157.8
1912	570,000	975	171.1

Source: Dödsaarsagerne i Kongeriget Danmarks Byer.
Note: Deaths of rural patients in hospitals are excluded.

Table 83
Mortality from Cancer in Copenhagen, by Sex, 1894-1912

MALES				FEMALES			
Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1894	181,110	185	102.1	1894	213,121	302	141.7
1895	184,821	204	110.4	1895	218,015	309	141.7
1896	188,522	206	109.3	1896	222,919	358	160.6
1897	192,213	226	117.6	1897	227,833	336	147.5
1898	195,894	273	139.4	1898	232,757	353	151.7
1899	199,564	253	126.8	1899	237,692	345	145.1
1900	203,223	262	128.9	1900	242,638	347	143.0
1896-1900	979,416	1,220	124.6	1896-1900	1,163,839	1,739	149.4
1901	206,873	279	134.9	1901	247,593	389	157.1
1902	211,370	285	134.8	1902	253,589	422	166.4
1903	215,855	279	129.3	1903	259,597	421	162.2
1904	220,327	294	133.4	1904	265,618	419	157.7
1905	224,737	321	142.8	1905	271,701	449	165.3
1901-1905	1,079,162	1,458	135.1	1901-1905	1,298,098	2,100	161.8
1906	229,133	347	151.4	1906	277,798	435	156.6
1907	233,513	356	152.5	1907	283,911	497	175.1
1908	237,879	358	150.5	1908	290,038	444	153.1
1909	242,231	360	148.6	1909	296,179	479	161.7
1910	246,567	410	166.3	1910	302,336	518	171.3
1906-1910	1,189,323	1,831	154.0	1906-1910	1,450,262	2,373	163.6
1911	250,870	369	147.1	1911	308,528	514	166.6
1912	255,645	428	167.4	1912	314,355	547	174.0

Source: Dödsaarsagerne i Kongeriget Danmarks Byer.
Note: Deaths of rural patients in hospitals are excluded.

42

APPENDIX G

Table 84

Cancer Census of Iceland, by Organs and Parts according to Sex, 1908

Organ or Part	MALES Cases of Cancer	MALES Rate per 100,000 Population	FEMALES Cases of Cancer	FEMALES Rate per 100,000 Population
Lips, jaw and tongue	1	2.5	2	4.7
Stomach	2	5.0	4	9.3
Intestines	1	2.5	1	2.3
Breast	..	..	5	11.7
Generative organs	..	..	5	11.7
Sarcoma	2	5.0	..	..
All organs	6	15.0	17	39.7

Source: Zählung der Krebskranken auf Island. In: Zeitschrift für Krebsforschung, 13. Band.

Table 85

Cancer Census of Finland, by Organs and Parts according to Sex, 1909

Organ or Part	MALES Cases of Cancer	MALES Per Cent.	FEMALES Cases of Cancer	FEMALES Per Cent.
Lips	60	24.6	10	3.2
Tongue and mouth	15	6.1	5	1.6
Œsophagus	10	4.1	5	1.6
Stomach	101	41.4	116	37.2
Liver and gall-bladder	6	2.5	4	1.3
Intestines	10	4.1	6	1.9
Rectum	4	1.6	8	2.6
Kidney	3	1.2	2	0.6
Vesica urinaria	4	1.6	1	0.3
Prostata and penis	6	2.5	..	..
Breast	..	..	60	19.2
Uterus	..	..	56	18.0
Ovaries and generative organs	..	..	10	3.2
Cancer cutis	16	6.6	15	4.8
Other or not specified organs	9	3.7	14	4.5
All organs	244	100.0	312	100.0

Source: Zeitschrift für Krebsforschung, 12. Band.

APPENDIX G

Table 86
Cases of Cancer in Finland, by Organs and Parts
1890-1907

Organ or Part	Carcinoma Per Cent.	All Malignant Tumors Per Cent.
....	18.9	15.8
....	2.8	3.9
th........	3.5	3.3
st........	10.4	9.0
phagus........	2.2	1.8
ıach........	24.2	20.3
stines........	1.9	1.6
um........	3.9	3.3
r and pancreas........	2.2	1.9
ale generative organs........	11.1	10.0
r or not specified organs........	18.9	29.1
rgans........	100.0	100.0

ıalignant tumors ....9,119 cases
inoma ....7,613 cases

Table 87
Comparative Distribution of Carcinoma, by Organs and Parts
Sweden and Finland, 1890-1907

Organ or Part	Sweden	Finland
....	4.2	18.9
gue........	1.5	1.6
st........	12.3	10.4
ɔhagus........	3.4	2.2
ıach........	45.3	24.2
tines and rectum........	8.6	5.8
r and pancreas........	2.6	2.2
ıle generative organs........	10.7	11.1
r or not specified organs........	11.4	23.6

ource: Über maligne Tumoren in Finland, 1890-1907. G. Renwall, In: Zeitschrift
rebsforschung, 9 Band. 1910.

Table 87a
Mortality from Cancer in Cities of Finland
1910

	Population	Deaths from Cancer	Rate per 100,000 Population
ngfors........	144,483	95	65.8
....	50,215	46	91.6
merfors........	45,078	18	39.9
rg........	27,101	16	59.0
laistad........	20,167	17	84.3
ɔorg........	19,501	10	51.3
ıeborg........	16,707	19	113.7
y-one other cities........	125,926	88	69.9
ities........	449,178	309	68.8

ɔurce: Lisitä Snomen Virallisecn Tilastoon: XI. Lääkintölaitos, 1910. Helsinski,

APPENDIX G

Table 88
Mortality from Cancer in the German Empire 1891-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	37,483,234	20,043	53.5	1906	60,407,847	49,127	81.3
1892	47,125,446	28,745	61.0	1907	61,259,086	50,930	83.1
1893	47,625,932	30,013	63.0	1908	62,110,325	51,948	83.6
1894	48,259,077	31,137	64.5	1909	62,953,056	53,214	84.5
1895	48,818,672	32,071	65.7	1910	63,751,143	56,092	88.0
1891-1895	229,312,361	142,009	61.9	1906-1910	310,481,457	261,311	84.2
1896	49,356,136	33,620	68.1	1911	64,612,000	57,519	89.0
1897	49,893,600	34,584	69.3	1912	65,450,000	58,937	90.0
1898	50,431,064	35,504	70.4				
1899	51,843,158	38,209	73.7				
1900	52,624,706	37,946	72.1				
1896-1900	254,148,664	179,863	70.8				
1901	53,406,252	39,917	74.7				
1902	54,187,799	40,613	74.9				
1903	54,969,346	42,535	77.4				
1904	58,433,571	46,723	80.0				
1905	59,413,982	48,078	80.9				
1901-1905	280,410,950	217,866	77.7				

Source: Statistisches Jahrbuch für das Deutsche Reich, 1913. Medizinal-statistische Mitteilungen aus dem kaiserlichen Gesundheitsamte, Annual Report of the Registrar-General of Births, Deaths and Marriages in England and Wales, 1910.

Note: Includes all kinds of tumors. 1891, only for Prussia, Bavaria and Baden. 1892-1903, only for ten of the states. 1904-1912, for all the Empire, except Mecklenburg-Schwerin and Mecklenburg-Strelitz.

Table 89
Mortality from Cancer in the German Empire, by Sex 1905-1912

MALES				FEMALES			
Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1905	29,279,210	21,556	73.6	1905	30,134,772	26,522	88.0
1906	29,781,068	21,936	73.7	1906	30,626,779	27,191	88.8
1907	30,212,981	22,806	75.5	1907	31,046,105	28,124	90.6
1908	30,651,445	23,225	75.8	1908	31,458,880	28,723	91.3
1909	31,061,038	23,885	76.9	1909	31,892,018	29,329	92.0
1910	31,461,189	25,001	79.5	1910	32,289,954	31,091	96.3
1906-1910	153,167,721	116,853	76.3	1906-1910	157,313,736	144,458	91.8
1911	31,886,022	25,769	80.8	1911	32,725,978	31,750	97.0
1912	32,312,665	26,442	81.8	1912	33,137,335	32,495	98.1

Source: Medizinal-statistische Mitteilungen aus dem kaiserlichen Gesundheitsamte.

Note: Includes all kinds of tumors. Does not include Mecklenburg-Schwerin and Mecklenburg-Strelitz.

Table 90

ity from Cancer and Other Tumors in Bavaria

1886-1912

	Population	Deaths from Cancer	Rate per 100,000 Population
	5,455,155	3,534	64.8
	5,490,111	3,516	64.0
	5,525,068	4,375	79.2
	5,560,025	4,527	81.4
	5,594,982	4,520	80.8
)	27,625,341	20,472	74.1
	5,639,694	4,984	88.4
	5,684,406	4,806	84.5
	5,729,118	5,126	89.5
	5,773,831	5,318	92.1
	5,818,544	5,499	94.5
5	28,645,593	25,733	89.8
	5,890,046	5,588	94.9
	5,961,548	5,750	96.5
	6,033,051	5,845	96.9
	6,104,554	6,192	101.4
	6,176,057	6,104	98.8
0	30,165,256	29,479	97.7
	6,245,720	6,407	102.6
	6,315,383	6,524	103.3
	6,385,046	6,859	107.4
	6,454,709	7,122	110.3
	6,524,372	7,074	108.4
5	31,925,230	33,986	106.5
	6,596,955	7,258	110.0
	6,669,539	7,104	106.5
	6,742,123	7,274	107.9
	6,814,707	7,472	109.6
	6,887,291	7,820	113.5
0	33,710,615	36,928	109.5
	6,959,875	7,828	112.5
	7,032,459	8,095	115.1

: Statistisches Jahrbuch für das ch Bayern.

Table 91

Mortality from Cancer and Other Tumors in Bavaria, Males

1886-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1886	2,656,115	1,492	56.2
1887	2,674,782	1,490	55.7
1888	2,693,471	1,802	66.9
1889	2,712,736	1,877	69.2
1890	2,731,120	1,867	68.4
1886-1890	13,468,224	8,528	63.3
1891	2,754,427	2,049	74.4
1892	2,777,401	2,074	74.7
1893	2,800,393	2,208	78.8
1894	2,823,403	2,340	82.9
1895	2,846,687	2,331	81.9
1891-1895	14,002,311	11,002	78.6
1896	2,883,178	2,426	84.1
1897	2,919,370	2,528	86.6
1898	2,955,592	2,552	86.3
1899	2,991,842	2,625	87.7
1900	3,028,100	2,668	88.1
1896-1900	14,778,082	12,799	86.6
1901	3,062,277	2,692	87.9
1902	3,095,801	2,777	89.7
1903	3,129,311	2,917	93.2
1904	3,162,807	3,068	97.0
1905	3,196,647	3,114	97.4
1901-1905	15,646,843	14,568	93.1
1906	3,233,168	3,137	97.0
1907	3,269,408	3,075	94.1
1908	3,305,663	3,149	95.3
1909	3,342,614	3,253	97.3
1910	3,379,580	3,432	101.6
1906-1910	16,530,433	16,046	97.1
1911	3,415,907	3,426	100.3
1912	3,452,234	3,538	102.5

Source: Statistisches Jahrbuch für das Königreich Bayern.

APPENDIX G

Table 92
Mortality from Cancer and Other Tumors in Bavaria, Females
1886-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1886	2,799,040	2,042	73.0
1887	2,815,329	2,026	72.0
1888	2,831,597	2,573	90.9
1889	2,847,289	2,650	93.1
1890	2,863,862	2,653	92.6
1886-1890	14,157,117	11,944	84.4
1891	2,885,267	2,935	101.7
1892	2,907,005	2,732	94.0
1893	2,928,725	2,918	99.6
1894	2,950,428	2,978	100.9
1895	2,971,857	3,168	106.6
1891-1895	14,643,282	14,731	100.6
1896	3,006,868	3,162	105.2
1897	3,042,178	3,222	105.9
1898	3,077,459	3,293	107.0
1899	3,112,712	3,567	114.6
1900	3,147,957	3,436	109.2
1896-1900	15,387,174	16,680	108.4
1901	3,183,443	3,715	116.7
1902	3,219,582	3,747	116.4
1903	3,255,735	3,942	121.1
1904	3,291,902	4,054	123.2
1905	3,327,725	3,960	119.0
1901-1905	16,278,387	19,418	119.3
1906	3,363,787	4,121	122.5
1907	3,400,131	4,029	118.5
1908	3,436,460	4,125	120.0
1909	3,472,093	4,219	121.5
1910	3,507,711	4,388	125.1
1906-1910	17,180,182	20,882	121.5
1911	3,543,968	4,402	124.2
1912	3,580,225	4,557	127.3

Source: Statistisches Jahrbuch für das Königreich Bayern.

Table 93
Mortality from Cancer in Bavaria, by Geographical Divisions
Rate per 100,000 of Population, Males
1905-1907

	Stomach Liver and Pancreas	Intestines and Rectum	All Organs
Oberbayern	63.6	15.4	104.4
Niederbayern	55.0	7.6	82.9
Schwaben	90.0	15.1	135.1
Oberpfalz	68.2	9.8	96.0
Mittelfranken	56.2	12.2	94.4
Pfalz	47.2	6.0	76.6
Oberfranken	59.7	7.4	82.6
Unterfranken	56.7	9.3	93.5
All Bavaria	61.8	10.9	96.6

Source: K. Kolb: Die Lokalisation des Krebses in den Organen in Bayern. In: Zeitschrift für Krebsforschung, 8. Band.

APPENDIX G

Table 94
Mortality from Cancer in Bavaria, by Geographical Divisions
Rate per 100,000 of Population, Females
1905-1907

	Stomach Liver and Pancreas	Intestines and Rectum	Uterus	Breast	All Organs
yern	59.2	11.3	34.4	11.9	138.5
›ayern	48.2	6.8	26.3	9.9	112.5
›en	76.0	12.7	28.5	13.0	155.2
ılz	50.0	8.5	15.7	9.0	101.6
ranken	53.1	9.3	24.8	9.0	119.4
	56.3	6.5	12.2	4.9	101.8
ınken	48.6	8.1	13.6	7.3	91.9
·anken	58.1	7.9	15.1	8.7	110.8
aria	56.7	9.1	22.7	9.4	119.3

rce: K. Kolb: Die Lokalisation des Krebses in den Organen in Bayern. In: rift für Krebsforschung, 8. Band.

Table 95
ılity from Cancer in Bavaria, by Organs and Parts, according to Sex
1905-1910

Organ or Part	MALES Deaths from Cancer	MALES Rate per 100,000 Population	FEMALES Deaths from Cancer	FEMALES Rate per 100,000 Population
ıd mouth	335	1.7	140	0.7
.agus, stomach and liver	12,373	62.9	11,291	55.0
nes	1,090	5.5	1,222	6.0
n	1,068	5.4	709	3.5
ladder	66	0.3	181	0.9
›as	108	0.5	98	0.5
ıeum	371	1.9	1,079	5.3
ı	183	0.9	45	0.2
and pleura	163	0.8	140	0.7
ys	162	0.8	109	0.5
›r	605	3.1	187	0.9
ta	204	1.0	..	..
ı	..	..	3,933	19.2
s	..	..	396	1.9
ı	..	..	105	0.5
	13	0.1	1,871	9.1
	158	0.8	168	0.8
	124	0.6	187	0.9
and extremities	659	3.3	716	3.5
organs	223	1.1	319	1.6
›ecified	347	1.8	502	2.4
;ans	18,252	92.5	23,398	114.1

rce: Bericht über das Bayerische Gesundheitswesen. München, 1912.

APPENDIX G

Table 95a
Mortality from Cancer in Bavaria, by Age
1901-1912

Age	Rate per 100,000 of Population 1901-1910	1910	1911	1912
Under 1	6.0	3.9	3.9	2.2
1–4	3.3	4.1	3.3	3.0
5–14	2.0	1.8	1.8	1.4
15–19	3.6	2.5	2.6	2.8
20–29	8.1	6.9	7.4	8.7
30–39	39.9	39.9	37.0	42.3
40–49	139.5	136.7	142.0	153.1
50–59	334.1	360.5	349.4	351.4
60–69	647.4	681.6	670.5	683.5
70–79	808.5	917.8	948.8	936.2
80 and over	663.9	745.2	724.3	777.6
All ages	108.0	113.5	112.5	115.1

Source: Bericht über das Bayerische Gesundheitswesen, 39. Band, die Jahre, 1911 und 1912, umfassend.

Table 96
Mortality from Cancer in Prussia
1881-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	27,400,370	8,525	31.1	1901	34,801,604	21,488	61.7
1882	27,608,242	8,778	31.8	1902	35,365,767	21,876	61.9
1883	27,816,114	9,383	33.7	1903	35,929,930	23,420	65.2
1884	28,023,986	9,865	35.2	1904	36,494,093	25,050	68.6
1885	28,231,858	10,108	35.8	1905	37,058,256	25,704	69.4
1881-1885	139,080,570	46,659	33.5	1901-1905	179,649,650	117,538	65.4
1886	28,509,431	10,919	38.3	1906	37,628,378	26,498	70.4
1887	28,836,793	10,981	38.1	1907	38,202,757	28,034	73.4
1888	29,164,155	11,906	40.8	1908	38,777,136	28,531	73.6
1889	29,491,517	12,819	43.5	1909	39,351,515	29,429	74.8
1890	29,818,879	12,904	43.3	1910	39,925,894	31,340	78.5
1886-1890	145,820,775	59,529	40.8	1906-1910	193,885,680	143,832	74.2
1891	30,176,929	13,487	44.7	1911	40,500,273	32,660	80.6
1892	30,556,897	15,122	49.5	1912	41,074,652	33,463	81.5
1893	30,936,865	15,740	50.8				
1894	31,316,833	16,480	52.6				
1895	31,696,801	16,850	53.2				
1891-1895	154,684,325	77,679	50.2				
1896	32,160,485	17,643	54.9				
1897	32,683,962	18,315	56.0				
1898	33,207,439	18,695	56.3				
1899	33,730,916	20,011	59.3				
1900	34,254,393	20,430	59.6				
1896-1900	166,037,195	95,094	57.3				

Source: Tables 96-98, Annual Reports of the Registrar-General of Births, Deaths and Marriages in England and Wales.

Statistisches Jahrbuch für den Preussischen Staat.

Das Gesundheitswesen des Preussischen Staat.

Note: Includes all tumors.

Table 97
Mortality from Cancer in Prussia
Males, 1898-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1898	16,334,739	8,595	52.6
1899	16,598,984	9,055	54.6
1900	16,863,438	9,418	55.8
1901	17,143,270	9,776	57.0
1902	17,428,250	10,011	57.4
1903	17,713,455	10,627	60.0
1904	17,998,887	11,454	63.6
1905	18,284,544	11,609	63.5
1901-1905	88,568,406	53,477	60.4
1906	18,573,367	11,972	64.5
1907	18,864,521	12,726	67.5
1908	19,155,905	12,874	67.2
1909	19,443,584	13,386	68.8
1910	19,731,377	14,155	71.7
1906-1910	95,768,754	65,113	68.0
1911	20,023,335	14,754	73.7
1912	20,315,293	15,142	74.5

Table 98
Mortality from Cancer in Prussia
Females, 1898-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1898	16,872,700	10,100	59.9
1899	17,131,932	10,956	64.0
1900	17,390,955	11,012	63.3
1901	17,658,334	11,712	66.3
1902	17,937,517	11,865	66.1
1903	18,216,475	12,793	70.2
1904	18,495,206	13,596	73.5
1905	18,773,712	14,095	75.1
1901-1905	91,081,244	64,061	70.3
1906	19,055,011	14,526	76.2
1907	19,338,236	15,308	79.2
1908	19,621,231	15,657	79.8
1909	19,907,931	16,043	80.6
1910	20,194,517	17,185	85.1
1906-1910	98,116,926	78,719	80.2
1911	20,476,938	17,906	87.4
1912	20,759,359	18,321	88.3

Table 98a
Mortality from Cancer in Prussia, by Age and Sex
Rate per 100,000 of Population
1903-1913

Year	TOTAL			MALES			FEMALES		
	Ages Under 30	Ages 30-59	Ages 60 and Over	Ages Under 30	Ages 30-59	Ages 60 and Over	Ages Under 30	Ages 30-59	Ages 60 and Over
1903....	1.4	92.0	404.7	1.1	81.7	431.9	1.8	101.8	328.6
1904....	1.6	95.4	427.2	1.3	86.1	458.5	2.0	104.2	401.7
1905....	1.5	93.6	439.5	1.2	82.8	464.0	1.7	103.9	419.6
1906....	1.6	94.5	446.6	1.2	82.9	474.1	1.9	105.7	424.5
1907....	1.5	97.4	464.6	1.3	85.6	493.6	1.6	108.7	441.3
1908....	1.4	98.5	464.9	1.0	87.0	491.0	1.8	109.6	444.0
1909....	1.6	99.1	476.6	1.4	87.8	507.0	1.7	109.8	452.3
1910....	1.5	103.7	502.8	1.2	90.7	534.1	1.8	116.2	477.8
1911....	1.5	101.6	524.9	1.4	89.5	552.6	1.7	113.2	503.0
1912....	1.5	100.0	535.9	1.3	86.6	574.0	1.6	112.8	505.7
1913....	1.6	101.3	541.6	1.4	86.6	576.9	1.7	115.5	513.8

Source: Statistisches Jahrbuch für den Preussischen Staat, 1914.
Note: Includes only carcinoma.

Table 99
Mortality from Cancer in Württemberg, by Sex
1904-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
TOTAL			
1904	2,275,100	1,967	86.5
1905	2,302,179	2,124	92.3
1906	2,329,258	2,053	88.1
1907	2,356,337	2,162	91.8
1908	2,383,416	2,215	92.9
1909	2,410,495	2,307	95.7
1910	2,437,574	2,344	96.2
1906-1910	11,917,080	11,081	93.0
1911	2,464,700	2,289	92.9
1912	2,491,826	2,511	100.8
MALES			
1904	1,109,339	853	76.9
1905	1,122,914	958	85.3
1906	1,136,911	924	81.3
1907	1,150,835	961	83.5
1908	1,164,775	963	82.7
1909	1,178,732	1,005	85.3
1910	1,192,392	1,013	85.0
1906-1910	5,823,645	4,866	83.6
1911	1,205,731	1,038	86.1
1912	1,219,070	1,105	90.6
FEMALES			
1904	1,165,761	1,114	95.6
1905	1,179,265	1,166	98.9
1906	1,192,347	1,129	94.7
1907	1,205,502	1,201	99.6
1908	1,218,641	1,252	102.7
1909	1,231,763	1,302	105.7
1910	1,245,182	1,331	106.9
1906-1910	6,093,435	6,215	102.0
1911	1,258,969	1,251	99.4
1912	1,272,756	1,406	110.5

Source: Statistisches Handbuch für das Königreich Württemberg.
Note: Includes only carcinoma.

Table 100
Mortality from Cancer in Baden
1881-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	1,573,873	1,189	75.5
1882	1,580,073	1,263	79.9
1883	1,586,273	1,238	78.0
1884	1,592,473	1,240	77.9
1885	1,598,673	1,322	82.7
1881-1885	7,931,365	6,252	78.8
1886	1,607,863	1,454	90.4
1887	1,619,108	1,363	84.2
1888	1,630,421	1,412	86.6
1889	1,641,825	1,480	90.1
1890	1,653,307	1,532	92.7
1886-1890	8,152,524	7,241	88.8
1891	1,666,611	1,572	94.3
1892	1,680,022	1,504	89.5
1893	1,693,540	1,643	97.0
1894	1,707,158	1,636	95.8
1895	1,720,904	1,719	99.9
1891-1895	8,468,235	8,074	95.3
1896	1,748,500	1,824	104.3
1897	1,776,539	1,750	98.5
1898	1,805,026	1,841	102.0
1899	1,833,988	1,858	101.3
1900	1,863,384	1,882	101.0
1896-1900	9,027,437	9,155	101.4
1901	1,890,934	2,055	108.7
1902	1,918,890	2,097	109.3
1903	1,947,258	2,088	107.2
1904	1,976,044	2,235	113.1
1905	2,006,168	2,205	109.9
1901-1905	9,739,294	10,680	109.7
1906	2,031,921	2,125	104.6
1907	2,058,004	2,101	102.1
1908	2,084,421	2,225	106.7
1909	2,111,176	2,343	111.0
1910	2,138,273	2,428	113.5
1906-1910	10,423,795	11,222	107.7
1911	2,164,694	2,419	111.7
1912	2,191,115	2,452	111.9

Source: Die Statistik des Bewegung der Bevölkerung sowie die medizinische und geburtshilfliche Statistik. Statistische Mitteilungen über das Groszherzogtum Baden.
Note: The data for 1905 and later years include only carcinoma.

APPENDIX G

Table 101
Mortality from Cancer in Baden, by Sex
1905-1912

MALES				FEMALES			
Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1905	993,454	979	98.5	1905	1,012,714	1,226	121.1
1906	1,006,004	947	94.1	1906	1,025,917	1,178	114.8
1907	1,018,506	989	97.1	1907	1,039,498	1,112	107.0
1908	1,031,372	986	95.6	1908	1,053,049	1,239	117.7
1909	1,044,399	1,049	100.4	1909	1,066,777	1,294	121.3
1910	1,057,376	1,121	106.0	1910	1,080,897	1,307	120.9
1906-1910	5,157,657	5,092	98.7	1906-1910	5,266,138	6,130	116.4
1911	1,070,225	1,167	109.0	1911	1,094,469	1,252	114.4
1912	1,083,074	1,083	100.0	1912	1,108,041	1,369	123.6

Source: Die Statistik des Bewegung der Bevölkerung sowie die medizinische und geburtshilfliche Statistik. Statistische Mitteilungen über das Groszherzogtum Baden.
Note: Includes only carcinoma.

Table 102
Mortality from Cancer in the Kingdom of Saxony, by Sex
1904-1912

TOTAL				FEMALES			
Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1904	4,416,686	3,533	80.0	1904	2,279,893	1,961	86.0
1905	4,478,963	3,701	82.6	1905	2,314,280	2,013	87.0
1906	4,551,500	3,843	84.4	1906	2,351,760	2,125	90.4
1907	4,622,400	4,012	86.8	1907	2,387,932	2,261	94.7
1908	4,690,700	3,916	83.5	1908	2,423,216	2,171	89.6
1909	4,749,900	3,948	83.1	1909	2,453,323	2,167	88.3
1910	4,778,000	3,994	83.6	1910	2,467,837	2,227	90.2
1906-1910	23,392,500	19,713	84.3	1906-1910	12,084,068	10,951	90.6
1911	4,810,000	4,172	86.7	1911	2,484,365	2,303	92.7
1912	4,840,000	4,200	86.8	1912	2,499,860	2,280	91.2

MALES			
Year	Population	Deaths from Cancer	Rate per 100,000 Population
1904	2,136,793	1,572	73.6
1905	2,164,683	1,688	78.0
1906	2,199,740	1,718	78.1
1907	2,234,468	1,751	78.4
1908	2,267,484	1,745	77.0
1909	2,296,577	1,781	77.6
1910	2,310,163	1,767	76.5
1906-1910	11,308,432	8,762	77.5
1911	2,325,635	1,869	80.4
1912	2,340,140	1,920	82.0

Source: Statistisches Jahrbuch für das Königreich Sachsen.
Note: Includes only carcinoma.

Table 103
Mortality from Cancer in Alsace-Lorraine, 1905-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1905	1,807,200	1,498	82.9
1906	1,822,000	1,414	77.6
1907	1,834,100	1,477	80.5
1908	1,845,500	1,543	83.6
1909	1,856,600	1,496	80.6
1910	1,868,900	1,516	81.1
1906-1910	9,227,100	7,446	80.7
1911	1,875,900	1,546	82.4
1912	1,883,000	1,551	82.4

Source: Statistisches Jahrbuch für Elsass-Lothringen.
Note: Includes only carcinoma.

Table 104
Mortality from Cancer in Heligoland 1840-1903

Years	Population	Deaths from Cancer	Rate per 100,000 Population
1840-1850	18,000	6	33.3
1851-1860	17,400	2	11.5
1861-1870	18,500	1	5.4
1871-1880	19,700	14	71.1
1881-1890	21,000	15	71.4
1891-1900	22,300	13	58.3
1901-1903	7,100	10	140.8
1840-1903	124,000	61	49.2

Source: Lindemann: Über Krebsstatistik auf Helgoland. In: Zeitschrift für Krebsforschung, 1. Band.

Table 103a
Mortality from Cancer and Other Tumors, by Age and Sex, according to Religious Confession, in the Grand-Duchy of Hesse, 1901-1912

	Number of Deaths from Cancer			
	Christians (1906-1910)		Jews (1901-1912)	
Ages	Males	Females	Males	Females
Under 1	2	6	..	..
1-14	35	31	1	..
15-29	47	60	1	6
30-59	962	1,471	43	102
60-69	975	1,189	63	74
70 and over	668	796	60	85
All ages	2,689	3,553	168	267

	Rate per 100,000 of Population			
	Christians (1906-1910)		Jews (1901-1912)	
Ages	Males	Females	Males	Females
Under 1	2	7	..	..
1-14	4	3	3	..
15-29	6	8	3	16
30-59	101	149	83	177
60-69	651	686	611	634
70 and over	877	893	1,044	1,342
All ages	88	116	119	177

Source: Die gegenwärtige Sterblichkeit der jüdischen und christlichen Bevölkerung des Groszherzogtums Hessen nach Geschlecht, Alter und Todesursachen. Von Regierungsrat Knöpfel, Darmstadt.

APPENDIX G

Table 105
Mortality from Cancer in Heligoland, by Organs and Parts according to Sex, 1840-1903

Organ or Part	Absolute Figures: Males	Absolute Figures: Females	Per Cent. of Total: Males	Per Cent. of Total: Females
Lips	3	..	15.7	..
Tongue	..	2	..	4.8
Throat	1	..	5.3	..
Stomach	13	18	68.4	42.8
Liver	1	2	5.3	4.8
Peritoneum	..	2	..	4.8
Intestines	1	..	5.3	..
Breast	..	8	..	19.0
Uterus	..	5	..	11.9
Not specified	..	5	..	11.9
All organs	19	42	100.0	100.0

Source: Lindemann: Über Krebsstatistik auf Helgoland. In: Zeitschrift für Krebsforschung, 1. Band.

Table 106
Mortality from Cancer in Hamburg, by Sex
1900-1912

TOTAL

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	761,130	769	101.0
1901	780,190	773	99.1
1902	797,850	805	100.9
1903	814,290	878	107.8
1904	834,996	908	108.7
1905	862,443	945	109.6
1901-1905	4,089,769	4,309	105.4
1906	889,951	898	100.9
1907	920,114	970	105.4
1908	944,374	1,038	109.9
1909	968,265	1,008	104.1
1910	1,000,400	1,082	108.2
1906-1910	4,723,104	4,996	105.8
1911	1,030,004	1,047	101.7
1912	1,063,201	1,101	103.6

Year	Population	Deaths from Cancer	Rate per 100,000 Population
MALES			
1907	456,745	442	96.8
1908	469,165	488	104.0
1909	481,421	462	96.0
1910	497,799	475	95.4
1911	512,942	443	86.4
1912	529,899	470	88.7
FEMALES			
1907	463,369	528	113.9
1908	475,209	550	115.7
1909	486,844	546	112.2
1910	502,601	607	120.8
1911	517,062	604	116.8
1912	533,302	631	118.3

Source: Bericht über die Medizinische Statistik des Hamburgischen Staates.

APPENDIX G

Table 107
Mortality from Cancer in Bremen
1896-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1896	195,042	196	100.5	1906	263,323	249	94.6
1897	200,609	190	94.7	1907	271,374	300	110.5
1898	206,176	176	85.4	1908	279,425	302	108.1
1899	211,723	197	93.0	1909	287,476	300	104.4
1900	217,315	199	91.6	1910	295,527	311	105.2
1896-1900	1,030,865	958	92.9	1906-1910	1,397,125	1,462	104.6
1901	225,240	191	84.8	1911	305,724	298	97.5
1902	231,427	214	92.5	1912	316,000	335	106.0
1903	238,896	268	112.2	1913	326,000	320	98.2
1904	244,733	227	92.8				
1905	255,272	258	101.1				
1901-1905	1,195,568	1,158	96.9				

Source: Jahrbuch für Bremische Statistik.
Note: Includes all kinds of tumors

Table 108
Mortality from Cancer in Bremen, by Sex
1896-1911

MALES				FEMALES			
Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1896	97,404	81	83.2	1896	97,638	115	117.8
1897	100,184	81	80.9	1897	100,425	109	108.5
1898	102,964	64	62.2	1898	103,212	112	108.5
1899	105,734	87	82.3	1899	105,989	110	103.8
1900	108,527	83	76.5	1900	108,788	116	106.6
1896-1900	514,813	396	76.9	1896-1900	516,052	562	108.9
1901	112,485	81	72.0	1901	112,755	110	97.6
1902	115,575	103	89.1	1902	115,852	111	95.8
1903	119,305	107	89.7	1903	119,591	161	134.6
1904	122,220	111	90.8	1904	122,513	116	94.7
1905	127,483	118	92.6	1905	127,789	140	109.6
1901-1905	597,068	520	87.1	1901-1905	598,500	638	106.6
1906	131,504	103	78.3	1906	131,819	146	110.8
1907	135,307	125	92.4	1907	136,067	175	128.6
1908	139,070	125	89.9	1908	140,355	177	126.1
1909	142,818	135	94.5	1909	144,658	165	114.1
1910	146,552	129	88.0	1910	148,975	182	122.2
1906-1910	695,251	617	88.7	1906-1910	701,874	845	120.4
1911	150,756	121	80.3	1911	154,968	177	114.2

Source: Jahrbuch für Bremische Statistik.
Note: Includes all kinds of tumors.

Table 109
Mortality from Cancer in Berlin
1881-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	1,158,559	749	64.6
1882	1,196,205	811	67.8
1883	1,232,716	845	68.5
1884	1,271,677	965	75.9
1885	1,315,665	915	69.5
1881-1885	6,174,822	4,285	69.4
1886	1,363,220	1,034	75.8
1887	1,414,969	1,059	74.8
1888	1,471,972	1,160	78.8
1889	1,528,681	1,279	83.7
1890	1,578,516	1,222	77.4
1886-1890	7,357,358	5,754	78.2
1891	1,606,617	1,303	81.1
1892	1,622,477	1,335	82.3
1893	1,640,994	1,411	86.0
1894	1,656,074	1,526	92.1
1895	1,678,924	1,622	96.6
1891-1895	8,205,086	7,197	87.7
1896	1,721,855	1,765	102.5
1897	1,756,398	1,704	97.0
1898	1,803,211	1,822	101.0
1899	1,846,217	1,971	106.8
1900	1,888,313	2,119	112.2
1896-1900	9,015,994	9,381	104.0
1901	1,893,941	2,180	115.1
1902	1,911,628	2,170	113.5
1903	1,946,076	2,271	116.7
1904	1,988,742	2,479	124.7
1905	2,042,402	2,557	125.2
1901-1905	9,782,789	11,657	119.2
1906	2,073,521	2,648	127.7
1907	2,076,437	2,693	129.7
1908	2,057,274	2,639	128.3
1909	2,057,610	2,782	135.2
1910	2,071,907	2,751	132.8
1906-1910	10,336,749	13,513	130.7
1911	2,084,045	2,870	137.7
1912	2,100,000	2,789	132.8

Source: Statistisches Jahrbuch der Stadt Berlin. Tabellen über die Bevölkerungsvorgänge Berlins.
Note: Includes all kinds of tumors.

Table 110
Mortality from Cancer in Berlin
Males, 1881-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	557,810	304	54.5
1882	574,735	274	47.7
1883	591,792	290	49.0
1884	609,774	375	61 5
1885	630,859	338	53.6
1881-1885	2,964,970	1,581	53.3
1886	654,598	367	56.1
1887	680,269	367	53.9
1888	707,164	443	62.6
1889	734,925	485	66.0
1890	757,963	467	61.6
1886-1890	3,534,919	2,129	60.2
1891	768,643	521	67.8
1892	772,777	534	69.1
1893	781,069	548	70.2
1894	786,093	599	76.2
1895	797,868	671	84.1
1891-1895	3,906,450	2,873	73.5
1896	817,980	716	87.5
1897	831,768	690	83.0
1898	855,572	761	88.9
1899	878,389	806	91.8
1900	901,847	891	98.8
1896-1900	4,285,556	3,864	90.2
1901	899,710	943	104.8
1902	907,477	887	97.7
1903	927,687	935	100.8
1904	953,119	1,001	105.0
1905	985,093	1,066	108.2
1901-1905	4,673,086	4,832	103.4
1906	1,002,518	1,081	107.8
1907	999,919	1,110	111.0
1908	985,355	1,085	110.1
1909	985,615	1,174	119.1
1910	994,297	1,154	116.1
1906-1910	4,967,704	5,604	112.8
1911	1,001,229	1,165	116.4
1912	1,005,000	1,148	114.2

Source: Statistisches Jahrbuch der Stadt Berlin. Tabellen über die Bevölkerungsvorgänge Berlins.
Note: Includes all kinds of tumors.

Table 1
Mortality from Cancer in Berlin
Females, 188 1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	600,749	445	74.1
1882	621,470	537	86.4
1883	640,924	555	86.6
1884	661,903	590	89.1
1885	684,806	577	84.3
1881-1885	3,209,852	2,704	84.2
1886	708,622	667	94.1
1887	734,700	692	94.2
1888	764,808	717	93.7
1889	793,756	794	100.0
1890	820,553	755	92.0
1886-1890	3,822,439	3,625	94.8
1891	837,974	782	93.3
1892	849,700	801	94.3
1893	859,925	863	100.4
1894	869,981	927	106.6
1895	881,056	951	107.9
1891-1895	4,298,636	4,324	100.6
1896	903,875	1,049	116.1
1897	924,630	1,014	109.7
1898	947,639	1,061	112.0
1899	967,828	1,165	120.4
1900	986,466	1,228	124.5
1896-1900	4,730,438	5,517	116.6
1901	994,231	1,237	124.4
1902	1,004,151	1,283	127.8
1903	1,018,389	1,336	131.2
1904	1,035,623	1,478	142.7
1905	1,057,309	1,491	141.0
1901-1905	5,109,703	6,825	133.6
1906	1,071,003	1,567	146.3
1907	1,076,518	1,583	147.0
1908	1,071,919	1,554	145.0
1909	1,071,995	1,608	150.0
1910	1,077,610	1,597	148.2
1906-1910	5,369,045	7,909	147.3
1911	1,082,816	1,705	157.4
1912	1,095,000	1,641	149.9

Source: Statistisches Jahrbuch der Stadt Berlin. Tabellen über die Bevölkerungsvorgänge Berlins.
Note: Includes all kinds of tumors.

Table 112
Mortality from Cancer in Frankfurt a/M.
1891-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	185,000	193	104.3
1892	189,000	180	95.2
1893	193,300	190	98.3
1894	199,600	182	91.2
1895	226,400	193	85.2
1891-1895	993,300	938	94.4
1896	233,500	211	90.4
1897	240,500	209	86.9
1898	247,400	249	100.6
1899	257,400	256	99.5
1900	285,000	228	80.0
1896-1900	1,263,800	1,153	91.2
1901	294,000	254	86.4
1902	302,000	270	89.4
1903	310,000	334	107.7
1904	320,000	307	95.9
1905	330,000	316	95.8
1901-1905	1,556,000	1,481	95.2
1906	340,000	322	94.7
1907	349,000	337	96.6
1908	358,000	357	99.7
1909	367,000	350	95.4
1910	410,000	388	94.6
1906-1910	1,824,000	1,754	96.2
1911	419,000	403	96.2
1912	428,500	352	82.1
1913	438,000	403	92.0

Source: Tabellarische Übersichten betreffend den Zivilstand der Stadt Frankfurt am Main.
Note: Includes only carcinoma.

APPENDIX G

Table 113
Mortality from Cancer in Frankfurt a/M., Males
1892-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1892	89,643	50	55.8
1893	91,663	68	74.2
1894	94,630	75	79.3
1895	107,314	84	78.3
1892-1895	383,250	277	72.3
1896	111,123	78	70.2
1897	114,911	84	73.1
1898	118,678	100	84.3
1899	123,938	99	79.9
1900	137,741	98	71.1
1896-1900	606,391	459	75.7
1901	142,237	93	65.4
1902	146,259	126	86.1
1903	150,288	145	96.5
1904	155,296	122	78.6
1905	160,314	117	73.0
1901-1905	754,394	603	79.9
1906	165,138	131	79.3
1907	169,474	133	78.5
1908	173,809	159	91.5
1909	178,142	134	75.2
1910	198,932	158	79.4
1906-1910	885,495	715	80.7
1911	203,257	161	79.2
1912	207,823	153	73.6
1913	212,000	161	75.9

Source: Tabellarische Übersichten betreffend den Zivilstand der Stadt Frankfurt am Main.
Note: Includes only carcinoma.

Table 114
Mortality from Cancer in Frankfurt a/M., Females
1892-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1892	99,357	130	130.8
1893	101,637	122	120.0
1894	104,970	107	101.9
1895	119,086	109	91.5
1892-1895	425,050	468	110.1
1896	122,377	133	108.7
1897	125,589	125	99.5
1898	128,722	149	115.8
1899	133,462	157	117.6
1900	147,259	130	88.3
1896-1900	657,409	694	105.6
1901	151,763	161	106.1
1902	155,741	144	92.5
1903	159,712	189	118.3
1904	164,704	185	112.3
1905	169,686	199	117.3
1901-1905	801,606	878	109.5
1906	174,862	191	109.2
1907	179,526	204	113.6
1908	184,191	198	107.5
1909	188,858	216	114.4
1910	211,068	230	109.0
1906-1910	938,505	1,039	110.7
1911	215,743	242	112.2
1912	220,677	199	90.2
1913	226,000	242	107.1

Source: Tabellarische Übersichten betreffend den Zivilstand der Stadt Frankfurt am Main.
Note: Includes only carcinoma.

APPENDIX G

Table 115
Mortality from Cancer in Frankfurt a/M., by Organs and Parts according to Sex, 1906-1912

Organ or Part	MALES Deaths from Cancer	MALES Rate per 100,000 Population	FEMALES Deaths from Cancer	FEMALES Rate per 100,000 Population
Skin	7	0.5	18	1.3
Digestive organs	869	67.0	817	59.4
Respiratory organs	50	3.9	38	2.8
Urinary organs	41	3.2	18	1.3
Generative organs	14	1.1	456	33.2
Other organs	48	3.7	133	9.7
Sarcoma	52	4.0	51	3.7
Other organs	55	4.2	61	4.4
All organs	1,136	87.6	1,592	115.8

Source: Jahresbericht des Aerztlichen Vereins zu Frankfurt am Main.

Table 116
Mortality from Cancer in Colonge 1891-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	286,336	237	82.8
1892	294,313	256	87.0
1893	302,290	255	84.4
1894	310,267	261	84.1
1895	318,244	301	94.6
1891-1895	1,511,450	1,310	86.7
1896	327,507	310	94.7
1897	337,700	298	88.2
1898	347,893	282	81.1
1899	358,086	340	94.9
1900	368,279	312	84.7
1896-1900	1,739,465	1,542	88.6
1901	379,081	356	93.9
1902	390,320	344	88.1
1903	401,559	370	92.1
1904	412,798	379	91.8
1905	424,037	394	92.9
1901-1905	2,007,795	1,843	91.8
1906	438,963	410	93.4
1907	456,524	426	93.3
1908	474,085	411	86.7
1909	491,646	441	89.7
1910	509,207	474	93.1
1906-1910	2,370,425	2,162	91.2
1911	526,768	525	99.7
1912	544,329	553	101.6

Source: Naturwissenschaft und Gesundheitswesen in Cöln. (Festschrift) 1908.
1909-1912, original data furnished by the Statistical Office of Cöln.

APPENDIX G

Table 117
Mortality from Cancer in Essen a/R., by Sex
1906-1912

TOTAL

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	233,590	141	60.4
1907	242,137	158	65.3
1908	255,423	162	63.4
1909	266,617	168	63.0
1910	289,309	161	55.6
1906-1910	1,287,076	790	61.4
1911	298,079	185	62.1
1912	305,024	180	59.0

MALES

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1908	131,926	59	44.7
1909	137,654	63	45.8
1910	149,341	68	45.5
1911	153,839	81	52.7
1912	157,392	84	53.4
1908-1912	730,152	355	48.6

FEMALES

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1908	123,497	103	83.4
1909	128,963	105	81.4
1910	139,968	93	66.4
1911	144,240	104	72.1
1912	147,632	96	65.0
1908-1912	684,300	501	73.2

Source: Statistisches Jahrbuch der Stadt Essen.

Table 118
Mortality from Cancer in Munich
1896-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1896	415,500	542	130.4
1897	430,000	632	147.0
1898	446,000	604	135.4
1899	466,000	669	143.6
1900	490,000	598	122.0
1896-1900	2,247,500	3,045	135.5
1901	503,000	707	140.6
1902	509,000	715	140.5
1903	515,000	749	145.4
1904	524,000	798	152.3
1905	534,000	812	152.1
1901-1905	2,585,000	3,781	146.3
1906	544,000	888	163.2
1907	554,000	905	163.4
1908	565,000	977	172.9
1909	577,000	890	154.2
1910	590,000	1,009	171.0
1906-1910	2,830,000	4,669	165.0
1911	604,000	979	162.1
1912	615,000	1,081	175.8

Source: Münchener Jahresübersichten.
Note. Includes all kinds of tumors.

APPENDIX G

Table 119
Mortality from Cancer in Munich, by Sex
1896-1911

MALES				FEMALES			
Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1896	201,767	184	91.2	1896	213,733	358	167.5
1897	209,023	252	120.6	1897	220,977	380	172.0
1898	217,024	221	101.8	1898	228,976	383	167.3
1899	226,989	255	112.3	1899	239,011	414	173.2
1900	238,924	238	99.6	1900	251,076	360	143.4
1896-1900	1,093,727	1,150	105.1	1896-1900	1,153,773	1,895	164.2
1901	243,653	249	102.2	1901	259,347	458	176.6
1902	244,880	261	106.6	1902	264,120	454	171.9
1903	246,067	264	107.3	1903	268,933	485	180.3
1904	248,638	293	117.8	1904	275,362	505	183.4
1905	251,621	303	120.4	1905	282,379	509	180.3
1901-1905	1,234,859	1,370	110.9	1901-1905	1,350,141	2,411	178.6
1906	256,877	356	138.6	1906	287,123	532	185.3
1907	262,153	340	129.7	1907	291,847	565	193.6
1908	267,923	382	142.6	1908	297,077	595	200.3
1909	274,190	353	128.7	1909	302,810	537	177.3
1910	280,899	395	140.6	1910	309,101	614	198.6
1906-1910	1,342,042	1,826	136.1	1906-1910	1,487,958	2,843	191.1
1911	288,108	376	130.5	1911	315,892	603	190.9

Source: Münchener Jahresübersichten.
Note: Includes all kinds of tumors.

Table 120
Mortality from Cancer in Munich, by Religious Confession according to Organs and Parts, Females
1907-1909

	All Cases of Carcinoma	Carcinoma Mammae		Carcinoma Uteri	
		Number	Per Cent.	Number	Per Cent.
Christians................	1,326	120	9.0	381	28.7
Jews....................	102	17	16.7	7	6.8

Population, 1905: 10,056 Jews, 528,927 others.

Source: A. Theilhaber and S. Greischer. Zur Aethiologie des Carcinoms. In: Zeitschrift für Krebsforschung, 9. Band.

Table 121
lity from Cancer in Dresden
1886-1912

	Population	Deaths from Cancer	Rate per 100,000 Population
	249,150	247	99.1
	254,950	257	100.8
	261,300	288	110.2
	267,750	281	104.9
	273,900	329	120.1
90	1,307,050	1,402	107.3
	280,550	344	122.6
	304,050	352	115.8
	312,900	380	121.4
	322,050	377	117.1
	332,100	386	116.2
95	1,551,650	1,839	118.5
	341,400	382	111.9
	369,800	476	128.7
	380,500	402	105.7
	388,400	468	120.5
	393,550	492	125.0
00	1,873,650	2,220	118.5
	400,900	506	126.2
	405,600	537	132.4
	491,500	588	119.6
	501,800	617	123.0
	511,050	606	118.6
05	2,310,850	2,854	123.5
	519,700	626	120.5
	527,600	672	127.4
	535,550	693	129.4
	539,850	692	128.2
	543,800	700	128.7
10	2,666,500	3,383	126.9
	551,150	763	139.2
	558,500	746	134.9

e: Statistisches Jahrbuch für die
Dresden.

Table 122
Mortality from Cancer in Leipzig
1881-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	151,562	157	103.6
1882	155,812	159	102.0
1883	160,064	159	99.3
1884	164,315	164	99.8
1885	168,567	141	83.6
1881-1885	800,320	780	97.5
1886	172,819	159	92.0
1887	177,071	177	100.0
1888	181,323	184	101.5
1889	211,598	204	96.4
1890	291,374	268	92.0
1886-1890	1,034,185	992	95.9
1891	362,118	291	80.4
1892	370,683	335	90.4
1893	379,247	341	89.9
1894	387,812	327	84.3
1895	396,377	362	91.3
1891-1895	1,896,237	1,656	87.3
1896	405,580	348	85.8
1897	416,812	414	99.3
1898	428,044	388	90.6
1899	439,276	434	98.8
1900	450,508	409	90.8
1896-1900	2,140,220	1,993	93.1
1901	460,880	437	94.8
1902	470,390	462	98.2
1903	479,900	510	106.3
1904	489,410	507	103.6
1905	498,920	499	100.0
1901-1905	2,399,500	2,415	100.6
1906	509,180	593	116.5
1907	518,682	591	113.9
1908	528,184	559	105.8
1909	537,686	502	93.4
1910	580,743	552	95.1
1906-1910	2,674,475	2,797	104.6
1911	595,710	582	97.7
1912	605,755	622	102.7

Source: Statistische Monatsberichte der Stadt Leipzig.
Communications statistiques publiées par le Bureau Municipal de Statistique d'Amsterdam, No. 33.

Table 123
Mortality from Cancer in Koenigsberg, 1881-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	142,067	77	54.2
1882	144,075	100	69.4
1883	146,111	84	57.5
1884	148,176	102	68.8
1885	150,270	104	69.2
1881-1885	730,699	467	63.9
1886	152,342	125	82.1
1887	154,405	108	69.9
1888	157,317	115	73.1
1889	159,832	104	65.1
1890	161,130	144	89.4
1886-1890	785,026	596	75.9
1891	161,473	129	79.9
1892	161,750	156	96.4
1893	163,120	180	110.3
1894	166,326	199	119.6
1895	171,053	187	109.3
1891-1895	823,722	851	103.3
1896	173,510	194	111.8
1897	177,189	171	96.5
1898	181,249	194	107.0
1899	185,014	208	112.4
1900	187,743	175	93.2
1896-1900	904,705	942	104.1
1901	189,818	208	109.6
1902	191,642	198	103.3
1903	193,511	213	110.1
1904	195,834	271	138.4
1905	198,874	270	135.8
1901-1905	969,679	1,160	119.6
1906	226,265	311	137.4
1907	231,787	322	138.9
1908	236,292	288	121.9
1909	241,120	284	117.8
1910	243,982	313	128.3
1906-1910	1,179,446	1,518	128.7
1911	249,067	300	120.4
1912	255,684	302	118.1

Source: Communications statistiques publiées par le Bureau Municipal de Statistique d'Amsterdam, No. 33.
Statistisches Jahrbuch für Königsberg, 1908-1912.

Table 124
Mortality from Cancer in Nuremberg, 1881-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	101,500	77	75.9
1882	104,510	95	90.9
1883	106,310	101	95.0
1884	108,810	102	93.7
1885	112,760	120	106.4
1881-1885	533,890	495	92.7
1886	116,550	160	137.3
1887	120,360	122	101.4
1888	125,990	141	111.9
1889	133,010	128	96.2
1890	139,640	144	103.1
1886-1890	635,550	695	109.4
1891	145,550	146	100.3
1892	148,370	141	95.0
1893	149,850	133	88.8
1894	153,960	138	89.6
1895	159,530	193	121.0
1891-1895	757,260	751	99.2
1896	166,310	189	113.6
1897	175,580	176	100.2
1898	192,120	193	100.5
1899	240,640	256	106.4
1900	254,180	232	91.3
1896-1900	1,028,830	1,046	101.7
1901	265,180	245	92.4
1902	267,730	261	97.5
1903	272,170	270	99.2
1904	280,000	290	103.6
1905	291,200	299	102.7
1901-1905	1,376,280	1,365	99.2
1906	298,946	300	100.4
1907	306,691	308	100.4
1908	314,436	315	100.2
1909	322,181	322	99.9
1910	329,926	346	[illegible]
1906-1910	1,572,180	1,591	101.
1911	337,671	356	105.4
1912	345,416	382	110.6

Source: Communications statistiques publiées par le Bureau Municipal de Statistique d'Amsterdam, No. 33.
Bericht über die Gesundtheitsverhältnisse und Gesundheitsanstalten in Nürnberg.

Table 125
tality from Cancer in Holland
1881-1913

	Population	Deaths from Cancer	Rate per 100,000 Population
l	4,087,334	2,353	57.6
2	4,143,524	2,421	58.4
3	4,199,018	2,436	58.0
4	4,251,669	2,621	61.6
5	4,307,142	2,841	66.0
885	20,988,687	12,672	60.4
3	4,363,434	2,925	67.0
7	4,420,864	2,887	65.3
3	4,478,401	3,111	69.5
)	4,527,264	3,411	75.3
)	4,537,990	3,332	73.4
390	22,327,953	15,666	70.2
.	4,593,155	3,648	79.4
2	4,645,660	3,712	79.9
3	4,701,243	3,798	80.8
4	4,764,279	3,859	81.0
5	4,827,549	4,122	85.4
395	23,531,886	19,139	81.3
3	4,894,055	4,329	88.5
7	4,966,431	4,487	90.3
3	5,039,418	4,685	93.0
)	5,107,098	4,900	95.9
)	5,159,347	4,733	91.7
900	25,166,349	23,134	91.9
.	5,217,243	4,894	93.8
2	5,292,647	5,040	95.2
3	5,368,051	5,331	99.3
4	5,443,455	5,356	98.4
5	5,518,859	5,618	101.8
905	26,840,255	26,239	97.8
3	5,594,263	5,673	101.4
7	5,669,667	5,816	102.6
3	5,745,071	5,947	103.5
)	5,820,475	6,012	103.3
)	5,895,879	6,279	106.5
910	28,725,355	29,727	103.5
l	5,971,283	6,501	108.9
2	6,046,687	6,636	109.7
3	6,163,500	6,747	109.5

ce: Jaarcijfers voor het Koninkrijk derlanden.
ragen tot de Statistiek van Neder- Statistiek van de Sterfte naar den d en naar de Oorzaken van den

Table 126
Mortality from Cancer in Holland by Sex, 1901-1913

MALES

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	2,577,318	2,367	91.8
1902	2,614,568	2,573	98.4
1903	2,651,817	2,668	100.6
1904	2,689,067	2,642	98.2
1905	2,726,316	2,816	103.3
1901-1905	13,259,086	13,066	98.5
1906	2,769,160	2,880	104.0
1907	2,806,485	2,830	100.8
1908	2,843,810	2,940	103.4
1909	2,881,135	2,997	104.0
1910	2,918,460	3,117	106.8
1906-1910	14,219,050	14,764	103.8
1911	2,955,785	3,276	110.8
1912	2,993,110	3,230	107.9
1913	3,050,933	3,324	109.0

FEMALES

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	2,639,925	2,527	95.7
1902	2,678,079	2,467	92.1
1903	2,716,234	2,663	98.0
1904	2,754,388	2,714	98.5
1905	2,792,543	2,802	100.3
1901-1905	13,581,169	13,173	97.0
1906	2,825,103	2,793	98.9
1907	2,863,182	2,986	104.3
1908	2,901,261	3,007	103.6
1909	2,939,340	3,015	102.6
1910	2,977,419	3,162	106.2
1906-1910	14,506,305	14,963	103.1
1911	3,015,498	3,225	106.9
1912	3,053,577	3,406	111.5
1913	3,112,567	3,423	110.0

Source: Jaarcijfers voor het Koninkrijk der Nederlanden.
Bijdragen tot de Statistiek van Nederland: Statistiek van de Sterfte naar den Leeftijd en naar de Oorzaken van den Dood.

APPENDIX G

Table 127
Mortality from Cancer in Holland, by Organs and Parts, according to Sex
1906-1912

Organ or Part	MALES		FEMALES	
	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population
Buccal cavity	761	5.26	206	1.39
Stomach and liver	10,424	71.99	8,067	54.61
Peritoneum, intestines and rectum	1,680	11.60	2,035	13.78
Female generative organs	..	..	1,929	13.06
Breast	11	0.08	1,470	9.95
Skin	250	1.73	186	1.26
Other or not specified organs	2,317	16.00	1,700	11.51
All organs	15,443	106.65	15,593	105.55

Source: Bijdragen tot de Statistiek van Nederland: Statistiek van de Sterfte naar den Leeftijd en naar de Oorzaken van den Dood.

Note: Includes only carcinoma.

Table 128
Mortality from Cancer in Amsterdam
1881-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	338,047	244	72.2
1882	350,201	254	72.5
1883	361,326	246	68.1
1884	366,660	276	75.3
1885	372,325	284	76.3
1881-1885	1,788,559	1,304	72.9
1886	378,686	290	76.6
1887	390,016	282	72.3
1888	399,424	300	75.1
1889	408,061	385	94.3
1890	417,539	343	82.1
1886-1890	1,993,726	1,600	80.3
1891	426,914	372	87.1
1892	437,892	399	91.1
1893	446,657	390	87.3
1894	450,189	394	87.5
1895	456,324	389	85.2
1891-1895	2,217,976	1,944	87.6
1896	494,189	425	86.0
1897	503,285	472	93.8
1898	512,953	510	99.4
1899	510,853	540	105.7
1900	520.602	507	97.4
1896-1900	2,541,882	2,454	96.5

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	530,718	512	96.5
1902	538,815	543	100.8
1903	546,534	578	105.8
1904	551,415	599	108.6
1905	557,614	623	111.7
1901-1905	2,725,096	2,855	104.8
1906	564,186	626	111.0
1907	565,654	596	105.4
1908	565,589	662	117.0
1909	566,131	637	112.5
1910	573,983	690	120.2
1906-1910	2,835,543	3,211	113.2
1911	580,960	664	114.3
1912	588,000	702	119.4
1913	595,000	683	114.8

Source: Statistisch Jaarboek der Gemeente Amsterdam.

Jaarcijfers voor het Koninkrijk der Nederlanden. 1913.

APPENDIX G

Table 129
Mortality from Cancer in Amsterdam, by Sex
1901-1912

MALES				FEMALES			
r	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1	251,820	219	87.0	1901	278,898	293	105.1
2	256,160	284	110.9	1902	282,655	259	91.6
3	260,590	263	100.9	1903	285,944	315	110.2
4	263,151	285	108.3	1904	288,264	314	108.9
5	266,381	312	117.1	1905	291,233	311	106.8
1905	1,298,102	1,363	105.0	1901-1905	1,426,994	1,492	104.6
6	269,850	310	114.9	1906	294,336	316	107.4
7	270,344	284	105.1	1907	295,310	312	105.7
8	270,230	317	117.3	1908	295,359	345	116.8
9	269,723	301	111.6	1909	296,408	336	113.4
0	273,976	316	115.3	1910	300,007	374	124.7
1910	1,354,123	1,528	112.8	1906-1910	1,481,420	1,683	113.6
1	277,863	311	111.9	1911	303,097	353	116.5
2	281,240	350	124.4	1912	306,760	352	114.7

Source: Statistisch Jaarboek der Gemeente Amsterdam.

Table 130
Mortality from Cancer in Amsterdam, by Organs and Parts, Males
1862-1902

	Number of Deaths from Carcinoma				Percentage of All Deaths from Carcinoma			
rgan or Part	1862-1867	1872-1877	1886-1891	1897-1902	1862-1867	1872-1877	1886-1891	1897-1902
ie	10	20	24	37	2.9	4.4	2.9	2.8
nx	2	1	7	16	0.6	0.2	0.8	1.2
ix	1	4	13	35	0.3	0.9	1.6	2.7
hagus	16	24	92	159	4.6	5.3	11.2	12.2
ich	212	246	416	613	61.3	53.8	50.7	46.9
ines	9	11	26	71	2.6	2.4	3.2	5.4
im	6	9	25	66	1.7	2.0	3.0	5.0
	39	69	91	133	11.3	15.1	11.1	10.2
neum	3	2	4	8	0.9	0.4	0.5	0.6
urinaria	2	9	22	28	0.6	2.0	2.7	2.1
t	..	..	1	2	0.0	0.0	0.1	0.2
	4	12	5	17	1.2	2.6	0.6	1.3
	4	5	12	19	1.2	1.1	1.5	1.5
organs	9	19	59	68	2.6	4.2	7.2	5.2
pecified	29	26	23	36	8.2	5.6	2.9	2.7
rcinoma	346	457	820	1,308	100.0	100.0	100.0	100.0

urce: Communications Statistiques publiées par le Bureau Municipal de Statis-d' Amsterdam, No. 26. Amsterdam, 1911.

APPENDIX G

Table 131
Mortality from Cancer in Amsterdam, by Organs and Parts, Females 1862-1902

Organ or Part	Number of Deaths from Carcinoma 1862-1867	1872-1877	1886-1891	1897-1902	Percentage of All Deaths from Carcinoma 1862-1867	1872-1877	1886-1891	1897-1902
Tongue	..	..	3	3	0.0	0.0	0.3	0.2
Pharynx	1	..	1	2	0.2	0.0	0.1	0.1
Larynx	..	3	1	1	0.0	0.5	0.1	0.1
Œsophagus	2	3	12	31	0.4	0.5	1.1	2.0
Stomach	133	197	365	464	25.7	30.4	33.8	29.2
Intestines	9	15	19	93	1.7	2.3	1.8	5.9
Rectum	6	6	23	54	1.2	0.9	2.1	3.4
Liver	65	98	156	242	12.6	15.1	14.5	15.2
Peritoneum	4	4	11	28	0.8	0.6	1.0	1.8
Vesica urinaria	..	2	16	24	0.0	0.3	1.5	1.5
Breast	77	83	123	158	14.9	12.8	11.4	9.9
Ovaries	1	3	10	28	0.2	0.5	0.9	1.8
Uterus	156	174	240	317	30.2	26.8	22.2	20.0
Vagina	7	3	5	7	1.4	0.5	0.5	0.4
Vulvae	..	1	2	9	0.0	0.2	0.2	0.6
Bones	2	5	4	11	0.4	0.8	0.4	0.7
Skin	7	7	6	10	1.4	1.1	0.6	0.6
Other organs	9	14	33	44	1.7	2.1	3.1	2.8
Not specified	38	31	49	62	7.2	4.6	4.4	3.8
All carcinoma	517	649	1,079	1,588	100.0	100.0	100.0	100.0

Source: Communications Statistiques publiées par le Bureau Municipal de Statistique d'Amsterdam, No. 26. Amsterdam, 1911.

Table 132
Mortality from Cancer in Amsterdam, by Organs and Parts according to Age, Males 1897-1902

Organ or Part	Number of Deaths from Carcinoma 34 and Under	35-44	45-54	55-64	65-74	75 and Over	Total
Buccal cavity and pharnyx	..	1	13	21	15	10	60
Œsophagus	1	9	34	46	54	15	159
Stomach	5	27	98	224	187	72	613
Intestines and rectum	5	10	20	43	45	14	137
Liver	3	3	26	48	35	18	133
Other organs	6	15	43	60	56	26	206
All carcinoma	20	65	234	442	392	155	1,308
	Percentage of All Ages						
Buccal cavity and pharynx	0.0	1.7	21.7	35.0	25.0	16.6	100.0
Œsophagus	0.6	5.7	21.4	28.9	34.0	9.4	100.0
Stomach	0.8	4.4	16.0	36.5	30.5	11.8	100.0
Intestines and rectum	3.6	7.3	14.6	31.5	32.8	10.2	100.0
Liver	2.3	2.3	19.5	36.1	26.3	13.5	100.0
Other organs	2.9	7.3	20.9	29.1	27.2	12.6	100.0
All carcinoma	1.5	5.0	17.9	33.8	30.0	11.8	100.0

Source: Communications Statistiques publiées par le Bureau Municipal de Statistique d'Amsterdam, No. 26. Amsterdam, 1911.

APPENDIX G

Table 133

Mortality from Cancer in Amsterdam, by Organs and Parts according to Age, Females 1897-1902

Organ or Part	Number of Deaths from Carcinoma: 34 and Under	35-44	45-54	55-64	65-74	75 and Over	Total
Buccal cavity and pharynx	1	2	1	1	1	1	7
Œsophagus	..	2	..	8	12	9	31
Stomach	3	24	57	128	152	100	464
Intestines and rectum	4	7	26	48	43	20	148
Liver	2	13	21	71	83	52	242
Breast	4	17	42	41	38	16	158
Uterus	21	45	95	90	51	15	317
Other organs	4	20	45	63	49	40	221
All carcinoma	39	130	287	450	429	253	1,588
	Percentage of All Ages						
Buccal cavity and pharynx	14.3	28.5	14.3	14.3	14.3	14.3	100.0
Œsophagus	0.0	6.5	0.0	25.8	38.7	29.0	100.0
Stomach	0.6	5.2	12.3	27.6	32.8	21.5	100.0
Intestines and rectum	2.7	4.7	17.6	32.4	29.1	13.5	100.0
Liver	0.8	5.4	8.7	29.3	34.3	21.5	100.0
Breast	2.5	10.8	26.6	25.9	24.1	10.1	100.0
Uterus	6.6	14.2	30.0	28.4	16.1	4.7	100.0
Other organs	1.8	9.0	20.4	28.5	22.2	18.1	100.0
All carcinoma	2.5	8.2	18.1	28.3	27.0	15.9	100.0

Source: Communications Statistiques publiées par le Bureau Municipal de Statistique d'Amsterdam, No. 26. Amsterdam, 1911.

Table 134

Mortality from Cancer in The Hague 1901-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	215,120	209	97.2
1902	220,253	229	104.0
1903	226,140	255	112.8
1904	232,132	244	105.1
1905	238,257	239	100.3
1901-1905	1,131,902	1,176	103.9
1906	245,525	263	107.1
1907	251,749	278	110.4
1908	256,758	272	105.9
1909	264,561	271	102.4
1910	275,312	318	115.5
1906-1910	1,293,905	1,402	108.4
1911	284,547	305	107.2
1912	294,540	324	110.0
1913	298,272	373	125.1

Source: Statistiek van de Sterfte naar den Leeftijd en naar de Oorzaken van den Dood (Statistiek van Nederland).

APPENDIX G

Table 135
Mortality from Cancer in The Hague, by Sex, 1901-1912

MALES				FEMALES			
Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	97,243	81	83.3	1901	117,877	128	108.6
1902	99,596	95	95.4	1902	120,657	134	111.1
1903	102,384	118	115.3	1903	123,756	137	110.7
1904	105,257	115	109.3	1904	126,875	129	101.7
1905	108,381	104	96.0	1905	129,876	135	103.9
1901-1905	512,861	513	100.0	1901-1905	619,041	663	107.1
1906	112,065	118	105.3	1906	133,460	145	108.6
1907	114,912	126	109.6	1907	136,837	152	111.1
1908	117,095	116	99.1	1908	139,663	156	111.7
1909	120,619	115	95.3	1909	143,942	156	108.4
1910	125,398	133	106.1	1910	149,914	185	123.4
1906-1910	590,089	608	103.1	1906-1910	703,816	794	112.8
1911	129,505	152	117.4	1911	155,042	153	98.7
1912	133,948	139	103.8	1912	160,592	185	115.2

Source: Statistiek van de Sterfte naar den Leeftijd en naar de Oorzaken van den Dood (Statistiek van Nederland).

Table 136
Mortality from Cancer in Rotterdam
1901-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	341,051	272	79.8
1902	348,474	275	78.9
1903	357,474	336	94.0
1904	370,390	304	82.1
1905	379,017	323	85.2
1901-1905	1,796,406	1,510	84.1
1906	390,364	370	94.8
1907	403,355	382	94.7
1908	411,635	348	84.5
1909	417,780	344	82.3
1910	426,888	394	92.3
1906-1910	2,050,022	1,838	89.7
1911	436,018	462	106.0
1912	445,137	432	97.0
1913	453,128	433	95.6

Source: Statistiek van de Sterfte naar den Leeftijd en naar de Oorzaken van den Dood (Statistiek van Nederland).

APPENDIX G

Table 137
Mortality from Cancer in Rotterdam, by Sex
1901-1912

MALES				FEMALES			
Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	163,650	115	70.3	1901	177,401	157	88.5
1902	167,542	129	77.0	1902	180,932	146	80.7
1903	172,244	151	87.7	1903	185,230	185	99.9
1904	178,680	131	73.3	1904	191,710	173	90.2
1905	183,045	152	83.0	1905	195,972	171	87.3
1901-1905	865,161	678	78.4	1901-1905	931,245	832	89.3
1906	189,036	181	95.7	1906	201,328	189	93.9
1907	195,678	173	88.4	1907	207,677	209	100.6
1908	199,754	172	86.1	1908	211,881	176	83.1
1909	202,627	152	75.0	1909	215,153	192	89.2
1910	207,716	185	89.1	1910	219,172	209	95.4
1906-1910	994,811	863	86.8	1906-1910	1,055,211	975	92.4
1911	212,561	203	95.5	1911	223,457	259	115.9
1912	217,528	195	89.6	1912	227,609	237	104.1

Source: Statistiek van de Sterfte naar den Leeftijd en naar de Oorzaken van den Dood (Statistiek van Nederland).

Table 138
Mortality from Cancer in Belgium
1903-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1903	6,876,303	4,084	59.4
1904	6,949,300	3,969	57.1
1905	7,022,297	4,203	59.9
1906	7,095,294	4,232	59.6
1907	7,168,291	4,396	61.3
1908	7,241,288	4,713	65.1
1909	7,314,285	4,786	65.4
1910	7,387,282	4,699	63.6
1906-1910	36,206,440	22,826	63.0
1911	7,460,279	5,140	68.9
1912	7,533,276	5,374	71.3

Source: Annuaire Statistique de la Belgique.

Table 139
Mortality from Cancer in Belgium
Males
1903-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1903	3,417,523	1,849	54.1
1904	3,453,802	1,771	51.3
1905	3,490,082	1,825	52.3
1906	3,519,266	1,892	53.8
1907	3,555,472	1,970	55.4
1908	3,591,679	2,068	57.6
1909	3,627,885	2,189	60.3
1910	3,664,092	2,083	56.8
1906-1910	17,958,394	10,202	56.8
1911	3,700,298	2,309	62.4
1912	3,736,505	2,476	66.3

Source: Annuaire Statistique de la Belgique.

Table 140
Mortality from Cancer in Belgium Females
1903-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1903	3,458,780	2,235	64.6
1904	3,495,498	2,198	62.9
1905	3,532,215	2,378	67.3
1906	3,576,028	2,340	65.4
1907	3,612,819	2,426	67.1
1908	3,649,609	2,645	72.5
1909	3,686,400	2,597	70.4
1910	3,723,190	2,616	70.3
1906-1910	18,248,046	12,624	69.2
1911	3,759,981	2,831	75.3
1912	3,796,771	2,898	76.3

Source: Annuaire Statistique de la Belgique.

Table 141
Mortality from Cancer in Liege
1903-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1903	166,280	131	78.8
1904	166,455	143	85.9
1905	166,630	163	97.8
1906	166,805	120	71.9
1907	166,980	160	95.8
1908	167,155	187	111.9
1909	167,330	153	91.4
1910	167,505	174	103.9
1906-1910	835,775	794	95.0
1911	167,676	187	111.5
1912	167,851	177	105.5

Source: Rapport Annuel des Services de L'État Civil et de la Population.

Table 142
Mortality from Cancer in Liege, by Sex
1905-1912

MALES

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1905	79,566	67	84.2
1906	79,499	54	67.9
1907	79,432	69	86.9
1908	79,365	72	90.7
1909	79,298	72	90.8
1910	79,230	79	99.7
1906-1910	396,824	346	87.2
1911	79,177	81	102.3
1912	79,108	77	97.3

FEMALES

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1905	87,064	96	110.3
1906	87,306	66	75.6
1907	87,5[illegible]8	91	103.9
1908	87,790	115	131.0
1909	88,032	81	92.0
1910	88,275	95	107.6
1906-1910	438,951	448	102.1
1911	88,499	106	119.8
1912	88,743	100	1[illegible].7

Source: Rapport Annuel des Servi[illegible] de L'État Civil et de la Population.

APPENDIX G

Table 143
Mortality from Cancer in Antwerp
1896-1912

	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
	260,568	124	47.6	1906	295,941	205	69.3
	264,198	149	56.4	1907	299,416	218	72.8
	267,829	150	56.0	1908	302,891	262	86.5
	271,460	155	57.1	1909	306,366	300	97.9
	275,091	156	56.7	1910	309,841	261	84.2
0	1,339,146	734	54.8	1906-1910	1,514,455	1,246	82.3
	278,566	173	62.1	1911	313,316	260	83.0
	282,041	180	63.8	1912	322,275	293	90.9
	285,516	202	70.7				
	288,991	203	70.2				
	292,466	213	72.8				
5	1,427,580	971	68.0				

Source: Stad Antwerpen. Gezondheidsbureel: Volksbeschrijvende Statistiek.

Table 144
Mortality from Cancer in Brussels
1901-1912

	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
	187,145	165	88.2	1906	182,110	168	92.3
	186,138	151	81.1	1907	181,103	205	113.2
	185,131	160	86.4	1908	180,096	187	103.8
	184,124	183	99.4	1909	179,090	185	103.3
	183,117	172	93.9	1910	178,084	181	101.6
5	925,655	831	89.8	1906-1910	900,483	926	102.8
				1911	177,078	198	111.8
				1912	176,947	188	106.2

Source: Ville de Bruxelles. Rapport Annual. Démographie Statistique.
Note: Without suburbs.

APPENDIX G

Table 145
Mortality from Cancer in France
1892-1911

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1892	12,223,548	10,761	88.0
1893	12,223,548	11,442	93.6
1894	12,223,548	11,607	95.0
1895	12,223,548	11,955	97.8
1892-1895	48,894,192	45,765	93.6
1896	12,869,412	12,212	94.9
1897	12,869,412	12,631	98.1
1898	12,869,412	12,789	99.4
1899	12,869,412	13,161	102.3
1900	12,869,412	13,392	104.1
1896-1900	64,347,060	64,185	99.7
1901	13,771,440	12,385	89.9
1902	13,771,440	12,463	90.5
1903	13,771,440	12,912	93.8
1904	13,771,440	13,312	96.7
1905	13,771,440	13,793	100.2
1901-1905	68,857,200	64,865	94.2
1906	39,282,000	27,306	69.5
1907	39,279,000	29,284	74.6
1908	39,368,000	30,124	76.5
1909	39,421,000	30,645	77.7
1910	39,528,000	31,303	79.2
1906-1910	196,878,000	148,662	75.5
1911	39,602,000	31,763	80.2

Source: Annual Report of the Registrar-General of Births, Deaths and Marriages in England and Wales, 1911.

Note: Previous to 1906 the data are for cities with more than 5,000 inhabitants only.

Table 146
Mortality from Cancer in Cities of France, according to Size
1906-1910

Size of Cities	Population	Deaths from Cancer	Rate per 100,000 Population
Paris	13,862,165	15,385	111.0
100,000–518,000 population	13,713,307	16,313	119.0
30,000–100,000 population	14,265,701	16,319	114.4
20,000–30,000 population	7,090,747	7,066	99.7
10,000–20,000 population	10,666,695	9,591	89.9
5,000–10,000 population	12,376,876	8,969	72.5
Under 5,000 population	124,902,507	75,019	60.1
Total, all France	196,877,998	148,662	75.5

Source: Annuaire Statistique de la France.

Table 147
:ality from Cancer in Paris
1881-1913

	Population	Deaths from Cancer	Rate per 100,000 Population
	2,239,928	2,178	97.2
	2,244,131	2,193	97.7
	2,248,334	2,114	94.0
	2,252,537	2,137	94.9
	2,256,741	2,215	98.2
35	11,241,671	10,837	96.4
	2,260,945	2,269	100.4
	2,293,697	2,240	97.7
	2,326,449	2,301	98.9
	2,359,201	2,332	98.8
	2,391,953	2,323	97.1
)0	11,632,245	11,465	98.6
	2,424,705	2,413	99.5
	2,442,089	2,318	94.9
	2,459,474	2,440	99.2
	2,476,859	2,537	102.4
	2,494,244	2,560	102.6
)5	12,297,371	12,268	99.8
	2,511,629	2,642	105.2
	2,541,415	2,719	107.0
	2,571,201	2,753	107.1
	2,600,987	2,735	105.2
	2,630,773	2,740	104.2
)0	12,856,005	13,589	105.7
	2,660,559	2,898	108.9
	2,672,993	2,832	105.9
	2,685,427	2,936	109.3
	2,697,861	2,890	107.1
	2,710,295	3,093	114.1
)5	13,427,135	14,649	109.1
	2,722,731	3,129	114.9
	2,747,582	3,053	111.1
	2,772,433	3,080	111.1
	2,797,284	3,050	109.0
	2,822,135	3,073	108.9
10	13,862,165	15,385	111.0
	2,847,229	3,205	112.6
	2,872,400	3,230	112.4
	2,897,500	3,212	110.9

e: Annuaire Statistique de la Paris.

Table 148
Mortality from Cancer in Paris
Males, 1893-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1893	1,184,483	851	71.8
1894	1,189,883	892	75.0
1895	1,195,491	963	80.6
1896	1,200,810	982	81.8
1897	1,212,255	1,044	86.1
1898	1,223,377	1,059	86.6
1899	1,234,689	1,066	86.3
1900	1,245,671	1,066	85.6
1896-1900	6,116,802	5,217	85.3
1901	1,256,848	1,081	86.0
1902	1,260,316	1,054	83.6
1903	1,263,762	1,132	89.6
1904	1,267,185	1,093	86.3
1905	1,270,857	1,184	93.2
1901-1905	6,318,968	5,544	87.7
1906	1,274,510	1,189	93.3
1907	1,286,967	1,110	86.2
1908	1,299,439	1,177	90.6
1909	1,311,926	1,199	91.4
1910	1,324,428	1,189	89.8
1906-1910	6,497,270	5,864	90.3
1911	1,337,121	1,297	97.0
1912	1,348,879	1,270	94.2
1913	1,360,666	1,327	97.5

Source: Annuaire Statistique de la Ville de Paris.

APPENDIX G

Table 149
Mortality from Cancer in Paris, Females
1893-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1893	1,274,991	1,589	124.6
1894	1,286,976	1,645	127.8
1895	1,298,753	1,597	123.0
1896	1,310,819	1,660	126.6
1897	1,329,160	1,675	126.0
1898	1,347,824	1,694	125.7
1899	1,366,298	1,669	122.2
1900	1,385,102	1,674	120.9
1896-1900	6,739,203	8,372	124.2
1901	1,403,711	1,817	129.4
1902	1,412,677	1,778	125.9
1903	1,421,665	1,804	126.9
1904	1,430,676	1,797	125.6
1905	1,439,438	1,909	132.6
1901-1905	7,108,167	9,105	128.1
1906	1,448,221	1,940	134.0
1907	1,460,615	1,943	133.0
1908	1,472,994	1,903	129.2
1909	1,485,358	1,851	124.6
1910	1,497,707	1,884	125.8
1906-1910	7,364,895	9,521	129.3
1911	1,510,108	1,908	126.3
1912	1,523,521	1,960	128.6
1913	1,536,834	1,885	122.7

Source: Annuaire Statistique de la Ville de Paris.

Table 150
Mortality from Cancer in Lyons, 1910-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1910	513,460	783	152.5
1911	523,796	805	153.7
1912	534,132	757	141.7
1910-1912	1,571,388	2,345	149.2

Source: Ville de Lyon, Bureau Municipal d'Hygiène et de statistique.

Table 151
Mortality from Cancer in Bordeaux
1909-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1909	257,786	262	101.6
1910	259,732	291	112.0
1911	261,678	309	118.1
1912	263,624	322	122.1
1909-1912	1,042,820	1,184	113.5

Source: Original data furnished by the Mayor of the City of Bordeaux.

Table 152
Mortality from Cancer in Nice
1909-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1909	139,456	134	96.1
1910	141,198	141	99.9
1911	142,940	155	108.4
1912	144,682	137	94.7
1909-1912	568,276	567	99.8

Source: Original data furnished by the Bureau d'Hygiène, Nice.

APPENDIX G

Table 153
Mortality from Cancer in Lille
1891-1912

	Population	Deaths from Cancer	Rate per 100,000 Population
	201,211	241	119.8
	204,224	234	114.6
	207,237	254	122.6
	210,250	239	113.7
	213,263	252	118.2
5	1,036,185	1,220	117.7
	216,276	235	108.7
	216,107	216	100.0
	215,938	254	117.6
	215,769	235	108.9
	215,600	267	123.8
0	1,079,690	1,207	111.8
	215,431	248	115.1
	213,470	243	113.8
	211,509	246	116.3
	209,548	239	114.1
	207,587	265	127.7
5	1,057,545	1,241	117.3

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	205,625	261	126.9
1907	208,061	248	119.2
1908	210,497	246	116.9
1909	212,933	305	143.2
1910	215,369	311	144.4
1906-1910	1,052,485	1,371	130.3
1911	217,807	316	145.1
1912	220,243	291	132.1

Source: Ville de Lille. Bureau Municipal d'Hygiène. Travaux statistiques.

Table 154
ılity from Cancer in Nancy
1901-1912

	Population	Deaths from Cancer	Rate per 100,000 Population
	102,559	116	113.1
	104,298	118	113.1
	106,037	132	124.5
	107,776	119	110.4
	109,515	141	128.7
5	530,185	626	118.1
	111,254	145	130.3
	112,993	144	127.4
	114,732	172	149.9
	116,471	129	110.8
	118,210	136	115.0
0	573,660	726	126.6
	119,949	128	106.7
	121,688	140	115.0

: Ville de Nancy. Annuaire Sta-
ət Démographique.

Table 155
Mortality from Cancer in Le Hâvre
1901-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	130,196	154	118.3
1902	130,642	142	108.7
1903	131,089	138	105.3
1904	131,536	167	127.0
1905	131,983	153	115.9
1901-1905	655,446	754	115.0
1906	132,430	177	133.7
1907	133,175	144	108.1
1908	133,921	195	145.6
1909	134,667	204	151.5
1910	135,413	160	118.2
1906-1910	669,606	880	131.4
1911	136,159	166	121.9
1912	136,905	192	140.2

Source: Rapport de la commission consultative du Bureau Municipal d'Hygiène. Ville du Hâvre.

Table 156

Mortality from Cancer in Switzerland, 1881-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	1,115,193	1,398	125.4
1882	1,673,700	1,817	108.6
1883	1,851,993	1,928	104.1
1884	1,865,861	2,086	111.8
1885	2,896,079	3,089	106.7
1881-1885	9,402,826	10,318	109.7
1886	2,906,983	3,294	113.3
1887	2,917,887	3,276	112.3
1888	2,928,791	3,389	115.7
1889	2,939,695	3,354	114.1
1890	2,950,599	3,405	115.4
1886-1890	14,643,955	16,718	114.2
1891	2,965,053	3,528	119.0
1892	3,002,263	3,706	123.4
1893	3,039,472	3,653	120.2
1894	3,076,682	3,802	123.6
1895	3,113,891	3,923	126.0
1891-1895	15,197,361	18,612	122.5
1896	3,151,101	3,916	124.3
1897	3,188,310	4,088	128.2
1898	3,225,520	4,125	127.9
1899	3,262,729	4,130	126.6
1900	3,299,939	4,285	129.9
1896-1900	16,127,599	20,544	127.4
1901	3,340,984	4,271	127.8
1902	3,384,769	4,258	125.8
1903	3,428,554	4,447	129.7
1904	3,472,339	4,464	128.6
1905	3,516,124	4,555	129.5
1901-1905	17,142,770	21,995	128.3
1906	3,559,909	4,593	129.0
1907	3,603,694	4,413	122.5
1908	3,647,479	4,669	128.0
1909	3,691,264	4,676	126.7
1910	3,735,049	4,612	123.5
1906-1910	18,237,395	22,963	125.9
1911	3,781,430	4,673	123.6
1912	3,831,220	4,598	120.0

Source: Die Bewegung der Bevölkerung in der Schweiz im Jahre 1881-1885. Ehe, Geburt und Tod in der Schweizerischen Bevölkerung während der zwanzig Jahre 1871-1890.

Statistiches Jahrbuch der Schweiz 1912.

Note: Does not include all the cantons, 1881-1884.

Table 157

Mortality from Cancer in Switzerland, Males

1881-1885, 1901-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	546,445	662	121.1
1882	820,113	874	106.6
1883	907,477	875	96.4
1884	914,272	950	103.9
1885	1,419,079	1,456	102.6
1881-1885	4,607,386	4,817	104.5
1901	1,637,082	2,128	130.0
1902	1,658,537	2,102	126.7
1903	1,679,991	2,202	131.1
1904	1,701,446	2,250	132.2
1905	1,722,901	2,252	130.7
1901-1905	8,399,957	10,934	130.2
1906	1,744,355	2,342	134.3
1907	1,765,810	2,190	124.0
1908	1,787,265	2,318	129.7
1909	1,808,719	2,271	125.6
1910	1,830,174	2,310	126.2
1906-1910	8,936,323	11,431	127.9
1911	1,852,901	2,342	126.4
1912	1,877,298	2,349	125.1

Source: Die Bewegung der Bevölkerung in der Schweiz im Jahre 1881-1885. Ehe, Geburt und Tod in der Schweizerischen Bevölkerung während der zwanzig Jahre 1871-1890.

Statistisches Jahrbuch der Schweiz 1912.

Note: Does not include all the cantons, 1881-1884.

APPENDIX G

Table 158
rtality from Cancer in Switzerland, Females, 1881-1885, 1901-1912

	Population	Deaths from Cancer	Rate per 100,000 Population
	568,748	736	129.4
	853,587	943	110.5
	944,516	1,053	111.5
	951,589	1,136	119.4
	1,477,000	1,633	110.6
35	4,795,440	5,501	114.7
	1,703,902	2,143	125.8
	1,726,232	2,156	124.9
	1,748,563	2,245	128.4
	1,770,893	2,214	125.0
	1,793,223	2,303	128.4
05	8,742,813	11,061	126.5

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	1,815,554	2,251	124.0
1907	1,837,884	2,223	121.0
1908	1,860,214	2,351	126.4
1909	1,882,545	2,405	127.8
1910	1,904,875	2,302	120.8
1906-1910	9,301,072	11,532	124.0
1911	1,928,529	2,331	120.9
1912	1,953,922	2,249	115.1

Source: Die Bewegung der Bevölkerung in der Schweiz im Jahre 1881-1885. Ehe, Geburt und Tod in der Schweizerischen Bevölkerung während der zwanzig Jahre 1871-1890.

Statistisches Jahrbuch der Schweiz 1912.

Note: Does not include all the cantons, 1881-1884.

Table 159
Mortality from Cancer in Switzerland, by Organs and Parts according to Sex, 1901-1910

gan or Part	Deaths from Cancer Total	Males	Females	Rate per 100,000 Population Total	Males	Females
....	516	478	38	1.46	2.76	0.21
gus...........	4,067	3,447	620	11.50	19.88	3.44
....	1,093	946	147	3.09	5.46	0.81
1.............	18,235	10,256	7,979	51.54	59.16	44.22
es............	2,220	937	1,283	6.27	5.40	7.11
....	1,683	981	702	4.76	5.66	3.89
....	604	434	170	1.71	2.50	0.94
:.............	311	311	..	0.88	1.79	..
....	2,394	14	2,380	6.77	0.08	13.19
....	3,299	..	3,299	9.32	..	18.28
testicle, etc....	304	97	207	0.86	0.56	1.15
....	508	..	508	1.44	..	2.82
....	153	129	24	0.43	0.74	0.13
ce and nose.....	666	269	397	1.88	1.55	2.20
l gland.........	680	339	341	1.92	1.96	1.89
ıd gall-bladder.	3,277	1,270	2,007	9.26	7.33	11.12
....	17	8	9	0.05	0.05	0.05
s............	545	294	251	1.54	1.70	1.39
:um	368	111	257	1.04	0.64	1.42
nd pleura......	236	138	98	0.67	0.80	0.54
....	254	144	110	0.72	0.83	0.61
nd jaw........	427	246	181	1.21	1.42	1.00
:gans	784	376	408	2.22	2.17	2.26
....	2,317	1,140	1,177	6.55	6.58	6.52
ns............	44,958	22,365	22,593	127.07	129.01	125.21

ce: Statistisches Jahrbuch der Schweiz, 1912.

APPENDIX G

Table 160

Mortality from Cancer in Switzerland, 1901-1910
Relative Mortality of Females, by Organs and Parts

Organ or Part	Rate per 100,000 Population: Males	Rate per 100,000 Population: Females	Relative Mortality of Females
Breast	0.08	13.19	16,488
Generative organs	0.56	22.25	3,973
Peritoneum	0.64	1.42	222
Liver and gall-bladder	7.33	11.12	152
Skin, face and nose	1.55	2.20	142
Other or not specified organs	2.17	2.26	104
Sarcoma	6.58	6.52	99
Intestines, rectum and pancreas	12.81	12.44	97
Thyroid gland	1.96	1.89	96
Stomach	59.16	44.22	75
Bones and jaw	1.42	1.00	70
Lungs and pleura	0.80	0.54	68
Kidneys and bladder	3.33	1.55	47
Lips	0.74	0.13	18
Œsophagus	19.88	3.44	17
Larynx	5.46	0.81	15
Tongue	2.76	0.21	8
All organs	129.01	125.21	97

Note: In this table the mortality of males from cancer of any organ or part is taken as 100 and the corresponding mortality of females is given accordingly.

Table 161

Mortality from Cancer in Switzerland, by Organs and Parts according to Sex, 1906-1910

Organ or Part	Males: Deaths from Cancer	Males: Rate per 100,000 Population	Females: Deaths from Cancer	Females: Rate per 100,000 Population
Lips	74	0.8	9	0.1
Tongue	265	3.0	20	0.2
Œsophagus	1,763	19.7	304	3.3
Stomach	5,045	56.5	3,987	42.9
Liver and gall-bladder	707	7.9	1,032	11.1
Peritoneum and mesentery	54	0.6	124	1.3
Intestines	515	5.8	695	7.5
Rectum	544	6.1	370	4.0
Pancreas	168	1.9	138	1.5
Ovaries	..	..	276	3.0
Uterus	..	..	1,609	17.3
Breast	10	0.1	1,264	13.6
Skin	123	1.4	221	2.4
Larynx	520	5.8	78	0.8
Lungs and pleura	72	0.8	60	0.6
Kidneys	67	0.7	60	0.6
Bladder	204	2.3	84	0.9
Prostate	194	2.2	..	..
Other or not specified	478	5.3	561	6.0
Sarcoma	628	7.0	640	6.9
All organs	11,431	127.9	11,532	124.0

Males, 45 years and over, 21.51 per cent. of population. Females, 45 years and over, 23.66 per cent. of population. (Census of 1900.)

APPENDIX G

Table 162
Mortality from Cancer in Switzerland, by Cantons and Race
1906-1910

n	Population	Deaths from Cancer	Rate per 100,000 Population
....	2,370,861	3,255	137.3
....	3,242,609	3,224	99.4
....	806,093	1,342	166.5
....	107,601	123	114.3
....	304,565	453	148.7
1........	83,892	131	156.2
len........	71,126	119	167.3
....	178,726	308	172.3
....	138,604	208	150.1
1........	554,417	672	121.2
.dt........	616,424	704	114.2
nd........	377,514	401	106.2
isen........	227,967	258	113.2
l A.-Rh........	304,565	412	135.3
l I.-Rh........	74,773	136	181.9
1........	1,376,923	2,040	148.2
....	1,136,190	1,497	131.8
....	621,895	876	140.9
l German........	12,594,745	16,159	128.3
....	703,963	825	117.2
....	1,548,355	1,538	99.3
....	629,190	280	44.5
l........	694,845	686	98.7
....	729,496	931	127.6
l French........	4,305,849	4,260	98.9
....	762,323	684	89.7
....	574,478	578	100.6
n and Romanish........	1,336,801	1,262	94.4

Table 163
Mortality from Cancer in Switzerland, by Age and Sex
1901-1910

	MALES			FEMALES			
	Summary Population	Deaths from Cancer	Rate per 100,000 Population	Ages	Summary Population	Deaths from Cancer	Rate per 100,000 Population
	7,182,421	196	2.7	Under 20	7,159,813	166	2.3
	3,035,583	205	6.8	20-29	3,096,331	207	6.7
	2,404,542	543	22.6	30-39	2,468,403	900	36.5
	1,790,838	2,253	125.8	40-49	1,918,065	2,829	147.5
	1,423,308	5,377	377.8	50-59	1,620,341	5,101	314.8
	970,832	8,000	824.0	60-69	1,151,200	7,319	635.8
	447,276	4,971	1,111.4	70-79	528,686	4,972	940.4
er	81,480	820	1,006.4	80 and over	101,046	1,099	1,087.6
	17,336,280	22,365	129.0	All Ages	18,043,885	22,593	125.2

Source: Statistisches Jahrbuch der Schweiz 1912.

Table 164
Mortality from Cancer in Bern
1901-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	65,295	76	116.4
1902	67,071	73	108.8
1903	69,035	72	104.3
1904	71,037	66	92.9
1905	72,671	80	110.1
1901-1905	345,109	367	106.3
1906	74,499	89	119.5
1907	76,174	77	101.1
1908	77,604	87	112.1
1909	82,284	83	100.9
1910	84,755	96	113.3
1906-1910	395,316	432	109.3
1911	85,780	75	87.4
1912	86,900	105	120.8

Source: Die Bewegung der Bevölkerung in der Schweiz.

Table 165
Mortality from Cancer in Basel
1901-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	110,310	90	81.6
1902	112,672	103	91.4
1903	115,351	101	87.6
1904	118,060	114	96.6
1905	120,738	135	111.8
1901-1905	577,131	543	94.1
1906	123,637	134	108.4
1907	126,575	114	90.1
1908	128,726	124	96.3
1909	128,691	155	120.4
1910	131,308	157	119.6
1906-1910	638,937	684	107.1
1911	133,470	158	118.4
1912	135,632	158	116.5

Source: Die Bewegung der Bevölkerung in der Schweiz.

Table 166
Mortality from Cancer in Geneva
1901-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	105,517	132	125.1
1902	108,336	128	118.2
1903	111,244	145	130.3
1904	115,587	116	100.4
1905	113,144	144	127.3
1901-1905	553,828	665	120.1
1906	116,445	143	122.8
1907	118,594	142	119.7
1908	121,192	133	109.7
1909	120,063	149	124.1
1910	122,391	150	122.6
1906-1910	598,685	717	119.8
1911	128,000	149	116.4
1912	130,000	185	142.3

Source: Die Bewegung der Bevölkerung in der Schweiz.

Table 167
Mortality from Cancer in Zurich
1901-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	150,377	160	106.4
1902	151,797	168	110.7
1903	155,964	175	112.2
1904	161,100	179	111.1
1905	166,126	190	114.4
1901-1905	785,364	872	111.0
1906	170,683	188	110.1
1907	175,149	196	111.9
1908	178,831	186	104.0
1909	183,650	221	120.3
1910	189,065	197	104.2
1906-1910	897,378	988	110.1
1911	194,480	203	104.4
1912	199,000	246	123.6

Source: Die Bewegung der Bevölkerung in der Schweiz.

APPENDIX G

Table 168
Mortality from Cancer in Austria
1895-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1895	24,650,770	15,757	63.9
1896	24,898,222	16,410	65.9
1897	25,153,390	17,109	68.0
1898	25,397,725	17,667	69.6
1899	25,655,952	17,961	70.0
1900	25,921,671	18,423	71.1
1896-1900	127,026,960	87,570	68.9
1901	26,178,756	19,154	73.2
1902	26,434,201	19,685	74.5
1903	26,668,312	19,728	74.0
1904	26,916,299	20,231	75.2
1905	27,083,056	20,744	76.6
1901-1905	133,280,624	99,542	74.7
1906	27,355,419	21,391	78.2
1907	27,598,480	21,431	77.7
1908	27,843,525	21,788	78.3
1909	28,070,718	22,180	79.0
1910	28,324,940	22,157	78.2
1906-1910	139,193,082	108,947	78.3
1911	28,516,220	23,585	82.7
1912	28,707,500	23,511	81.9

Source: Bewegung der Bevölkerung der im Reichsrate vertretenen Königreiche und Länder.

Table 169
Mortality from Cancer in Austria, by Sex
1901-1912

MALES				FEMALES			
Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	12,749,054	8,722	68.4	1901	13,429,702	10,432	77.7
1902	12,873,456	8,974	69.7	1902	13,560,745	10,711	79.0
1903	12,984,801	8,932	68.8	1903	13,683,511	10,796	78.9
1904	13,105,546	9,099	69.4	1904	13,810,753	11,132	80.6
1905	13,186,740	9,446	71.6	1905	13,896,316	11,298	81.3
1901-1905	64,899,597	45,173	69.6	1901-1905	68,381,027	54,369	79.5
1906	13,316,618	9,834	73.8	1906	14,038,801	11,557	82.3
1907	13,434,940	9,846	73.3	1907	14,163,540	11,585	81.8
1908	13,554,228	10,139	74.8	1908	14,289,297	11,649	81.5
1909	13,662,018	10,340	75.7	1909	14,408,700	11,840	82.2
1910	13,787,028	10,242	74.3	1910	14,537,912	11,915	82.0
1906-1910	67,754,832	50,401	74.4	1906-1910	71,438,250	58,546	82.0
1911	13,878,844	11,090	79.9	1911	14,637,376	12,495	85.4
1912	13,970,660	11,131	79.7	1912	14,736,840	12,380	84.0

Source: Bewegung der Bevölkerung der im Reichsrate vertretenen Königreiche und Länder.

APPENDIX G

Table 170

Mortality from Cancer in Austria, by Provinces and Race 1907-1911

Province	Population	Deaths from Cancer	Rate per 100,000 Population	Race Constitution, 1910
Lower Austria............	17,272,023	20,632	119.5	95.9% German
Upper Austria............	4,201,966	5,708	135.8	99.7% German
Salzburg.................	1,052,264	1,474	140.1	99.7% German
Styria...................	7,210,591	6,918	95.9	70.5% German, 29.4% Sloven
Carinthia................	1,947,234	1,622	83.3	78.6% German, 21.2% Sloven
Tyrol....................	4,640,064	5,081	109.5	57.3% German, 42.1% Italian
Vorarlberg...............	711,880	890	125.0	95.4% German
Silesia..................	3,709,688	2,482	66.9	43.9% German, 31.7% Polish, 24.3% Bohen
Total *German*..........	40,745,710	44,807	*110.0*	
Trieste *Italian*............	1,110,874	1,103	*99.3*	62.3% Italian, 29.8% Sloveni
Carniola.................	2,594,840	1,267	48.8	94.4% Slovenic
Goritz and Gradiska......	1,276,793	587	46.0	61.9% Slovenic, 36.1% Italiar
Total *Slovenic*..........	3,871,633	1,854	*47.9*	
Istria...................	1,968,684	838	42.6	43.5% Serbo-Croatic, 38.1% ian, 14.3% Slovenic
Dalmatia................	3,170,366	773	24.4	96.2% Serbo-Croatic
Total *Serbo-Croatic*.....	5,139,050	1,611	*31.3*	
Bohemia.................	33,293,281	34,642	104.1	63.2% Bohemian, 36.8% Gern
Moravia.................	12,891,685	12,484	96.8	71.8% Bohemian, 27.6% Gern
Total *Bohemian*........	46,184,966	47,126	*102.0*	
Galicia..................	39,375,765	12,844	32.6	58.6% Polish, 40.2% Rutheni
Bukowina...............	3,925,885	1,796	45.7	38.4% Ruthenian, 34.4% Ru nian, 21.2% German
Total *Polish-Ruthenian*..	43,301,650	14,640	*33.8*	
Total for *Austria*......	140,353,883	111,141	*79.2*	35.58% German, 60.65% Sla 3.73% Latin, 0.4% Magyar.

Source: Österreichische Statistik: Bewegung der Bevölkerung der im Reichsrate ve tenen Königreiche und Länder.

APPENDIX G

Table 171
Mortality from Malignant Tumors in Austrian Cities
1909-1910

	Population	Deaths from Cancer 1909	1910	1909-1910	Rate per 100,000 Population
....	3,993,125	2,220	2,319	4,539	113.7
....	443,051	202	281	483	109.0
ʒ..........	402,978	188	194	382	94.8
....	439,947	199	184	383	87.1
....	291,760	128	129	257	88.1
....	300,822	248	215	463	153.9
....	248,195	153	109	262	105.6

ce: Österreichisches Städtebuch. 14. Band.
:: Non-residents are excluded.

Table 172
Mortality from Cancer in Vienna
1900-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	1,662,124	1,915	115.2
1901	1,687,790	1,951	115.6
1902	1,714,007	1,884	109.9
1903	1,740,638	2,137	122.8
1904	1,767,690	2,099	118.7
1905	1,856,408	2,135	115.0
1901-1905	8,766,533	10,206	116.4
1906	1,886,652	2,080	110.2
1907	1,917,396	2,406	125.5
1908	1,948,648	2,505	128.6
1909	1,980,416	2,469	124.7
1910	2,012,709	2,558	127.1
1906-1910	9,745,821	12,018	123.3
1911	2,045,002	2,680	131.1
1912	2,077,295	2,759	132.8

Source: Bericht des Wiener Stadtphysikates.
Bewegung der Bevölkerung der im Reichsrate vertretenen Königreiche und Länder.
Statistisches Jahrbuch der Stadt Wien.

APPENDIX G

Table 173
Mortality from Cancer in Vienna, by Sex
1900-1912

MALES				FEMALES			
Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	796,562	782	98.2	1900	865,562	1,133	130.9
1901	808,924	773	95.6	1901	878,866	1,178	134.0
1902	821,489	837	101.9	1902	892,518	1,047	117.3
1903	834,253	956	114.6	1903	906,385	1,181	130.3
1904	847,218	886	104.6	1904	920,472	1,213	131.8
1905	889,739	934	105.0	1905	966,669	1,201	124.2
1901-1905	4,201,623	4,386	104.4	1901-1905	4,564,910	5,820	127.5
1906	904,235	881	97.4	1906	982,417	1,199	122.0
1907	918,970	1,079	117.4	1907	998,426	1,327	132.9
1908	933,948	1,094	117.1	1908	1,014,700	1,411	139.1
1909	949,174	1,102	116.1	1909	1,031,242	1,367	132.6
1910	964,651	1,159	120.1	1910	1,048,058	1,399	133.5
1906-1910	4,670,978	5,315	113.8	1906-1910	5,074,843	6,703	132.1
1911	980,128	1,194	121.8	1911	1,064,874	1,486	139.5
1912	995,605	1,301	130.7	1912	1,081,690	1,458	134.8

Source: Bericht des Wiener Stadtphysikates.
Statistisches Jahrbuch der Stadt Wien.

Table 174
Mortality from Cancer among the Jewish Population of Vienna
1898-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1898	140,718	125	88.8	1906	163,962	196	119.5
1899	142,825	113	79.1	1907	166,801	341	204.4
1900	146,926	122	83.0	1908	169,640	311	183.3
				1909	172,479	364	211.0
1901	149,766	134	89.5	1910	175,318	250	142.6
1902	152,606	139	91.1				
1903	155,445	95	61.1	1906-1910	848,200	1,462	172.4
1904	158,284	156	98.6				
1905	161,123	180	111.7	1911	178,157	240	134.7
				1912	180,996	226	124.9
1901-1905	777,224	704	90.6				

Source: Bericht des Vorstandes der Israelitischen Kultusgemeinde in Wien über seine Tätigkeit. (Biennial reports.)

Table 175

rtionate Mortality from Cancer among the Jewish Population of Vienna, by Sex, 1898-1912

	MALES			FEMALES			
	Deaths from All Causes	Deaths from Cancer	Cancer in Per Cent. of All Causes	Year	Deaths from All Causes	Deaths from Cancer	Cancer in Per Cent of All Causes
	996	69	6.9	1898	768	56	7.3
	1,058	66	6.2	1899	858	47	5.5
	1,027	63	6.1	1900	853	59	6.9
	1,053	63	6.0	1901	893	71	8.0
	1,111	72	6.5	1902	897	67	7.5
	1,011	42	4.2	1903	846	53	6.3
	1,065	83	7.8	1904	917	73	8.0
	1,131	92	8.1	1905	971	88	9.1
05	5,371	352	6.6	1901-1905	4,524	352	7.8
	1,136	101	8.9	1906	841	95	11.3
	1,089	174	16.0	1907	911	167	18.3
	1,148	150	13.1	1908	986	161	16.3
	1,248	197	15.8	1909	1,000	167	16.7
	1,195	119	10.0	1910	991	131	13.2
10	5,816	741	12.7	1906-1910	4,729	721	15.2
	1,249	112	9.0	1911	1,059	128	12.1
	1,264	124	9.8	1912	987	102	10.3

Source: Bericht des Vorstandes der Israelitischen Kultusgemeinde in Wien über seine Tätigkeit. (Biennial reports.)

Table 176

Mortality from Cancer in Hungary 1897-1912

	Population	Deaths from Cancer	Rate per 100,000 Population
	18,554,494	5,388	29.0
	18,738,579	5,458	29.1
	18,927,595	5,267	27.8
	19,144,142	7,021	36.7
00	75,364,810	23,134	30.7
	19,342,190	6,941	35.9
	19,513,336	7,461	38.2
	19,669,177	7,742	39.4
	19,831,663	8,112	40.9
	19,869,296	8,110	40.8
05	98,225,662	38,366	39.1

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	20,099,028	8,229	40.9
1907	20,210,113	8,635	42.7
1908	20,458,762	9,022	44.1
1909	20,606,760	9,175	44.5
1910	20,792,709	9,489	45.6
1906-1910	102,167,372	44,550	43.6
1911	20,980,265	9,718	46.3
1912	21,168,000	9,970	47.1

Source: Ungarisches statistisches Jahrbuch, 1897-1899. A Magyar szent korona orszagainak, 1900-1908 évi., Nepmozgalma, Budapest.

Ungarisches statistisches Jahrbuch, 1909.

Annuaire statistique Hongrois., 1910-1912.

APPENDIX G

Table 177
Mortality from Cancer in Hungary, by Sex
1897-1908

Year	Population	Deaths from Cancer	Rate per 100,000 Population
	MALES		
1897	9,232,716	2,276	24.7
1898	9,324,317	2,301	24.7
1899	..	..	..
1900	9,526,125	3,080	32.3
1901	9,620,805	3,135	32.6
1902	9,702,031	3,396	35.0
1903	9,775,581	3,428	35.1
1904	9,852,370	3,627	36.8
1905	9,867,092	3,521	35.7
1901-1905	48,817,879	17,107	35.0
1906	9,977,157	3,593	36.0
1907	10,028,258	3,803	37.9
1908	10,145,500	4,011	39.5
1906-1908	30,150,915	11,407	37.8
	FEMALES		
1897	9,321,778	3,112	33.4
1898	9,414,262	3,157	33.5
1899	..	..	..
1900	9,618,017	3,941	41.0
1901	9,721,385	3,806	39.2
1902	9,811,305	4,065	41.4
1903	9,893,596	4,314	43.6
1904	9,979,293	4,485	44.9
1905	10,002,204	4,589	45.9
1901-1905	49,407,783	21,259	43.0
1906	10,121,871	4,636	45.8
1907	10,181,855	4,832	47.5
1908	10,313,262	5,011	48.6
1906-1908	30,616,988	14,479	47.3

Source: Ungarisches statistisches Jahrbuch, 1897-1899. A Magyar szent korona orszagainak, 1900-1908 évi, Nepmozgalma, Budapest.

Table 178

y from Cancer in Hungary, by Organs and Parts, according to Sex 1901-1904

an or Part	MALES Deaths from Cancer	MALES Rate per 100,000 Population	FEMALES Deaths from Cancer	FEMALES Rate per 100,000 Population
	179	0.5	28	0.1
	359	0.9	37	0.1
	218	0.6	46	0.1
ıs	329	0.8	57	0.1
	6,098	15.7	5,116	13.0
	1,245	3.2	1,318	3.3
	28	0.1	13	0.0
	243	0.6	209	0.5
stines	755	1.9	912	2.3
m	11	0.0	49	0.1
	390	1.0	75	0.2
	61	0.2	68	0.2
	435	1.1	108	0.3
land	78	0.2	16	0.0
rative organs	66	0.2	..	..
	..	..	4,596	11.7
ale generative organs	..	..	96	0.2
	8	0.0	934	2.4
	115	0.3	42	0.1
	524	1.3	343	0.9
ans	114	0.3	128	0.3
fied	720	1.8	745	2.0
	11,976	30.7	14,936	37.9

: Ungarische statistische Mitteilungen. Neue Serie, 19. Band. Statistik der ıken in den Ländern der Ungarischen heiligen Krone.

Table 179

Percentage Distribution of Cancer Cases in Hungary by Organs and Parts, according to Sex, 1904

an or Part	MALES Cases	MALES Per Cent.	FEMALES Cases	FEMALES Per Cent.
	415	30.12	39	1.79
system	542	39.33	333	15.28
ystem	14	1.02	11	0.50
	6	0.44	496	22.76
e system	35	2.54	972	44.61
ry system	27	1.96	6	0.28
ystem	1	0.07	..	0.00
ıds	13	0.94	10	0.46
	44	3.19	21	0.96
ad and face	243	17.63	245	11.24
her parts	38	2.76	46	2.11
	1,378	100.00	2,179	100.00

: Ungarische statistische Mitteilungen. Neue Serie, 19. Band. Statistik der ıken in den Ländern der Ungarischen heiligen Krone.

APPENDIX G

Table 180
Mortality from Cancer in Hungary, by Race
1901-1904

Race	Population	Deaths from Cancer	Rate per 100,000 Population
Magyar	36,141,954	15,950	44.1
German	8,411,451	4,741	56.4
Rumanian	11,305,074	1,280	11.3
Slovak	7,996,899	2,278	28.5
Croatian	6,843,219	1,226	17.9
Serbian	4,247,087	819	19.3
Ruthenian	1,754,347	80	4.6
Others	1,656,335	538	32.5
Total	78,356,366	26,912	34.3

Source: Ungarische statistische Mitteilungen. Neue Serie, 19. Band. Statistik der Krebskranken in den Ländern der Ungarischen heiligen Krone.

Table 181
Mortality from Cancer in Budapest
1881-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	377,393	221	58.6
1882	390,646	253	64.8
1883	403,899	294	72.8
1884	417,152	277	66.4
1885	430,405	248	57.6
1881-1885	2,019,495	1,293	64.0
1886	443,658	303	68.3
1887	456,911	332	72.7
1888	470,164	314	66.8
1889	483,417	313	64.7
1890	496,670	327	65.8
1886-1890	2,350,820	1,589	67.6
1891	517,616	449	86.7
1892	540,079	477	88.3
1893	562,543	391	69.5
1894	585,008	434	74.2
1895	607,471	493	81.2
1891-1895	2,812,717	2,244	79.8
1896	629,934	415	65.9
1897	652,397	483	74.0
1898	674,862	506	75.0
1899	697,325	533	76.4
1900	719,788	554	77.0
1896-1900	3,374,306	2,491	73.8
1901	738,602	598	81.0
1902	749,092	720	96.1
1903	759,579	737	97.0
1904	770,067	779	101.2
1905	780,560	716	91.7
1901-1905	3,797,900	3,550	93.5
1906	791,748	732	92.5
1907	810,664	834	102.9
1908	829,580	819	98.7
1909	848,496	858	101.1
1910	867,412	936	107.9
1906-1910	4,147,900	4,179	100.7
1911	886,328	843	95.1
1912	905,244	994	109.8

Source: Die Sterblichkeit der Stadt Budapest.
Statistisch-Administratives Jahrbuch der Stadt Budapest.

Table 182
Mortality from Cancer in Budapest Males, 1881-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	189,866	62	32.7
1882	196,456	75	38.2
1883	203,040	94	46.3
1884	209,619	88	42.0
1885	216,192	96	44.4
1881-1885	1,015,173	415	40.9
1886	222,761	111	49.8
1887	229,324	121	52.8
1888	235,881	121	51.3
1889	242,434	101	41.7
1890	248,931	113	45.4
1886-1890	1,179,331	567	48.1
1891	259,119	164	63.3
1892	269,985	181	67.0
1893	280,878	127	45.2
1894	291,685	139	47.7
1895	302,460	190	62.8
1891-1895	1,404,127	801	57.0
1896	313,266	150	47.9
1897	323,980	172	53.1
1898	334,664	199	59.5
1899	345,385	194	56.2
1900	356,079	201	56.4
1896-1900	1,673,374	916	54.7
1901	365,165	256	70.1
1902	370,126	275	74.3
1903	375,156	308	82.1
1904	380,182	327	86.0
1905	385,206	302	78.4
1901-1905	1,875,835	1,468	78.3
1906	390,569	301	77.1
1907	399,738	319	79.8
1908	408,900	338	82.7
1909	418,054	337	80.6
1910	427,200	442	103.5
1906-1910	2,044,461	1,737	85.0
1911	436,346	344	78.8
1912	445,492	428	96.1

Source: Die Sterblichkeit der Stadt Budapest.
Statistisch-Administratives Jahrbuch der Stadt Budapest.

Table 183
Mortality from Cancer in Budapest Females, 1881-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	187,527	159	84.8
1882	194,190	178	91.7
1883	200,859	200	99.6
1884	207,533	189	91.1
1885	214,213	152	71.0
1881-1885	1,004,322	878	87.4
1886	220,897	192	86.9
1887	227,587	211	92.7
1888	234,283	193	82.4
1889	240,983	212	88.0
1890	247,739	214	86.4
1886-1890	1,171,489	1,022	87.2
1891	258,497	285	110.3
1892	270,094	296	109.6
1893	281,665	264	93.7
1894	293,323	295	100.6
1895	305,011	303	99.3
1891-1895	1,408,590	1,443	102.4
1896	316,668	265	83.7
1897	328,417	311	94.7
1898	340,198	307	90.2
1899	351,940	339	96.3
1900	363,709	353	97.1
1896-1900	1,700,932	1,575	92.6
1901	373,437	342	91.6
1902	378,966	445	117.4
1903	384,423	429	111.6
1904	389,885	452	115.9
1905	395,354	414	104.7
1901-1905	1,922,065	2,082	108.3
1906	401,179	431	107.4
1907	410,926	515	125.3
1908	420,680	481	114.3
1909	430,442	521	121.0
1910	440,212	494	112.2
1906-1910	2,103,439	2,442	116.1
1911	449,982	499	110.9
1912	459,752	566	123.1

Source: Die Sterblichkeit der Stadt Budapest.
Statistisch-Administratives Jahrbuch der Stadt Budapest.

APPENDIX G

Table 184
Mortality from Cancer in Budapest, by Religious Confession
1902-1906

Year	Deaths from All Causes	Carcinoma: Deaths	Carcinoma: Per Cent. of All Causes	Carcinoma Uteri: Deaths	Carcinoma Uteri: Per Cent. of All Carcinoma
NON-JEWISH MORTALITY					
1902	12,332	702	5.69	162	23.1
1903	12,591	708	5.62	132	18.6
1904	12,821	817	6.37	157	19.2
1905	13,471	714	5.30	127	17.8
1906	13,880	602	4.34	137	22.8
1902-1906	65,095	3,543	5.44	715	20.2
JEWISH MORTALITY					
1902	2,400	167	6.96	10	6.0
1903	2,468	188	7.62	18	9.6
1904	2,614	192	7.35	13	6.8
1905	2,623	153	5.83	15	9.8
1906	2,500	183	7.32	12	6.6
1902-1906	12,605	883	7.01	68	7.7

Source: F. Theilhaber: Sociale Stellung und Rasse bei Uteruscarcinom. In: Zeitschrift für Krebsforschung, 8. Band.

Table 185
Mortality from Cancer in Italy
1887-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1887	29,614,430	12,631	42.7
1888	29,825,022	12,625	42.3
1889	30,035,038	12,923	43.0
1890	30,245,054	12,917	42.7
1887-1890	119,719,544	51,096	42.7
1891	30,455,070	13,094	43.0
1892	30,665,662	13,069	42.6
1893	30,875,678	13,234	42.9
1894	31,085,694	13,841	44.5
1895	31,295,710	15,089	48.2
1891-1895	154,377,814	68,327	44.3
1896	31,506,302	15,482	49.1
1897	31,716,318	15,967	50.3
1898	31,926,334	16,330	51.1
1899	32,136,350	16,680	51.9
1900	32,346,366	16,873	52.2
1896-1900	159,631,670	81,332	50.9
1901	32,533,337	17,141	52.7
1902	32,699,510	17,634	53.9
1903	32,839,509	17,774	54.1
1904	33,016,234	18,860	57.1
1905	33,193,289	19,348	58.3
1901-1905	164,281,879	90,757	55.2
1906	33,325,098	20,653	62.0
1907	33,514,702	20,668	61.7
1908	33,826,688	21,828	64.5
1909	34,077,068	21,871	64.2
1910	34,376,609	22,555	65.6
1906-1910	169,120,165	107,575	63.6
1911	34,688,814	23,172	66.8
1912	35,026,486	22,661	64.7

Source: Statistica delle Cause di Morte.

APPENDIX G

Table 186
Mortality from Cancer in Italy, Males
1896-1912

	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
	15,674,385	6,598	42.1	1906	16,462,598	8,929	54.2
	15,778,868	6,634	42.0	1907	16,522,748	9,085	55.0
	15,883,351	6,843	43.1	1908	16,606,874	9,747	58.7
	15,987,834	6,980	43.7	1909	16,731,840	9,603	57.4
	16,092,317	7,190	44.7	1910	16,844,538	9,818	58.3
00	79,416,755	34,245	43.1	1906-1910	83,168,598	47,182	56.7
	16,185,335	7,399	45.7	1911	17,030,126	10,137	59.5
	16,251,656	7,571	46.6	1912	17,195,903	10,070	58.6
	16,304,816	7,673	47.1				
	16,376,052	8,271	50.5				
	16,430,678	8,417	51.2				
05	81,548,537	39,331	48.2				

Source: Statistica delle Cause di Morte.

Table 187
Mortality from Cancer in Italy, Females
1896-1912

	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
	15,831,917	8,884	56.1	1906	16,862,500	11,724	69.5
	15,937,450	9,333	58.6	1907	16,991,954	11,583	68.2
	16,042,983	9,487	59.1	1908	17,219,814	12,081	70.2
	16,148,516	9,700	60.1	1909	17,345,228	12,268	70.7
	16,254,049	9,683	59.6	1910	17,532,071	12,737	72.6
00	80,214,915	47,087	58.7	1906-1910	85,951,567	60,393	70.3
	16,348,002	9,742	59.6	1911	17,658,688	13,035	73.8
	16,447,854	10,063	61.2	1912	17,830,583	12,591	70.6
	16,534,693	10,101	61.1				
	16,640,182	10,589	63.6				
	16,762,611	10,931	65.2				
05	82,733,342	51,426	62.2				

Source: Statistica delle Cause di Morte.

APPENDIX G

Table 188
Mortality from Cancer in Italy, by Provinces
1906-1910

Province	Population	Deaths from Cancer	Rate per 100,000 Population
Piemonte	16,700,015	11,775	70.5
Liguria	5,838,536	4,396	75.3
Lombardia	23,400,341	18,987	81.1
Veneto	17,201,497	11,116	64.6
Northern Italy	63,140,389	46,274	73.3
Emilia	13,075,413	12,118	92.7
Toscana	13,141,273	12,557	95.6
Marche	5,331,467	3,729	69.9
Umbria	3,348,323	1,973	58.9
Roma	6,351,526	4,100	64.6
Central Italy	41,248,002	34,477	83.6
Abruzzi	6,977,124	3,244	46.5
Campania	16,151,582	7,363	45.6
Puglie	10,388,107	4,031	38.8
Bassilicata	2,311,658	946	40.9
Calabrie	6,837,870	2,541	37.2
Sicilia	17,908,500	7,354	41.1
Sardegna	4,156,933	1,345	32.4
Southern Italy	64,731,774	26,824	41.4
All Italy	169,120,165	107,575	63.6

Source: Statistica delle Cause di Morte nell'anno 1906-1910.

Table 189
Mortality from Cancer in Italy, by Organs and Parts
1891-1910

Organ or Part	Deaths from Cancer 1891-1895	1896-1900	1901-1905	1906-1910	Rate per 100,000 Population 1891-1895	1896-1900	1901-1905	1906-1910
Bones and joints	306	982	1,998	1,375	0.20	0.62	1.22	0.81
Mouth, lips, tongue, palate, thyroid, larynx, trachea	2,491	4,777	5,587	4,820	1.61	2.99	3.40	2.85
Stomach and œsophagus	19,577	22,756	26,237	33,089	12.68	14.26	15.97	19.57
Liver, spleen, pancreas, intestines and peritoneum	11,569	15,545	18,256	21,700	7.49	9.74	11.11	12.83
Nervous system	309	587	448	2,071	0.20	0.37	0.27	1.22
Bladder, urethra, prostate, penis and testicle	1,320	1,502	1,800	2,239	0.86	0.94	1.10	1.32
Breast	4,372	4,590	4,592	5,103	2.83	2.88	2.79	3.02
Uterus, vagina and ovary	11,654	12,548	12,700	13,741	7.55	7.86	7.73	8.13
Not specified	16,729	18,045	19,139	23,437	10.84	11.30	11.65	13.86
All organs	68,327	81,332	90,757	107,575	44.26	50.95	55.24	63.62

Source: Statistica delle Cause di Morte, 1891-1910.

APPENDIX G

Table 190
Mortality from Cancer in Rome, 1898-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1898	438,417	347	79.1
1899	446,539	350	78.4
1900	454,661	380	83.6
1901	462,783	355	76.7
1902	470,717	425	90.3
1903	478,651	429	89.6
1904	486,585	456	93.7
1905	494,519	455	92.0
1901-1905	2,393,255	2,120	88.6
1906	502,453	429	85.4
1907	510,387	494	96.8
1908	518,321	493	95.1
1909	526,255	534	101.5
1910	534,189	530	99.2
1906-1910	2,591,605	2,480	95.7
1911	542,123	574	105.9
1912	550,057	548	99.6

Source: Statistica delle Cause di Morte, Roma.

Table 191
Mortality from Cancer in Naples
1898-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1898	554,154	342	61.7
1899	557,616	318	57.0
1900	560,078	364	65.0
1901	563,540	351	62.3
1902	574,990	375	65.2
1903	586,439	369	62.9
1904	597,888	401	67.1
1905	609,337	336	55.1
1901-1905	2,932,194	1,832	62.5
1906	620,786	464	74.7
1907	632,235	417	66.0
1908	643,684	453	70.4
1909	655,133	418	63.8
1910	666,582	411	61.7
1906-1910	3,218,420	2,163	67.2
1911	678,031	463	68.3
1912	689,480	423	61.4

Source: Statistica delle Cause di Morte, Roma.

Table 192
Mortality from Cancer in Genoa
1898-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1898	226,430	229	101.1
1899	229,190	200	87.3
1900	231,950	218	94.0
1901	234,710	227	96.7
1902	238,462	216	90.6
1903	242,213	255	105.3
1904	245,964	240	97.6
1905	249,715	220	88.1
1901-1905	1,211,064	1,158	95.6
1906	253,466	293	115.6
1907	257,217	281	109.2
1908	260,968	273	104.6
1909	264,719	286	108.0
1910	268,470	271	100.9
1906-1910	1,304,840	1,404	107.6
1911	272,221	285	104.7
1912	275,972	278	100.7

Source: Statistica delle Cause di Morte, Roma.

APPENDIX G

Table 193
Mortality from Cancer in Turin, 1898-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1898	323,356	334	103.3
1899	327,456	312	95.3
1900	331,556	343	103.5
1901	335,656	364	108.4
1902	344,801	365	105.9
1903	353,946	347	98.0
1904	363,091	397	109.3
1905	372,236	378	101.5
1901-1905	1,769,730	1,851	104.6

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	381,381	398	104.4
1907	390,526	425	108.8
1908	399,671	489	122.4
1909	408,816	471	115.2
1910	417,961	432	103.4
1906-1910	1,998,355	2,215	110.8
1911	427,106	462	108.2
1912	436,251	487	111.6

Source: Statistica delle Cause di Morte, Roma.

Table 194
Mortality from Cancer in Milan
1898-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1898	466,027	459	98.5
1899	474,508	486	102.4
1900	482,989	483	100.0
1901	491,460	466	94.8
1902	502,234	520	103.5
1903	513,008	513	100.0
1904	523,782	588	112.3
1905	534,556	606	113.4
1901-1905	2,565,040	2,693	105.0

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	545,330	658	120.7
1907	556,104	635	114.2
1908	566,878	640	112.9
1909	577,652	688	119.1
1910	588,426	686	116.6
1906-1910	2,834,390	3,307	116.7
1911	599,200	812	135.5
1912	609,974	736	120.7

Source: Statistica delle Cause di Morte, Roma.

Table 195
Mortality from Cancer in Florence
1898-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1898	201,677	301	149.2
1899	202,981	278	137.0
1900	204,285	313	153.2
1901	205,589	287	139.6
1902	208,317	327	157.0
1903	211,044	292	138.4
1904	213,771	293	137.1
1905	216,498	340	157.0
1901-1905	1,055,219	1,539	145.8

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	219,225	345	157.4
1907	221,952	343	154.5
1908	224,679	393	174.9
1909	227,406	393	172.8
1910	230,133	351	152.5
1906-1910	1,123,395	1,825	162.5
1911	232,860	335	143.9
1912	235,587	389	165.1

Source: Statistica delle Cause di Morte, Roma.

APPENDIX G

Table 196
Mortality from Cancer in Palermo, 1898-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1898	299,989	128	42.7
1899	303,224	125	41.2
1900	306,459	140	45.7
1901	309,694	129	41.7
1902	312,837	133	42.5
1903	315,976	138	43.7
1904	319,115	125	39.2
1905	322,254	150	46.5
1901-1905	1,579,876	675	42.7
1906	325,393	159	48.9
1907	328,532	149	45.4
1908	331,671	166	50.0
1909	334,810	196	58.5
1910	337,949	177	52.4
1906-1910	1,658,355	847	51.1
1911	341,088	192	56.3
1912	344,227	161	46.8

Source: Statistica delle Cause di Morte, Roma.

Table 197
Mortality from Cancer in Spain, 1900-1912

Year	Population	Death from Cancer	Rate per 100,000 Population
1900	18,566,200	7,294	39.3
1901	18,657,000	7,912	42.4
1902	18,755,000	8,117	43.3
1903	18,853,000	8,315	44.1
1904	18,951,000	8,825	46.6
1905	19,049,000	8,719	45.8
1901-1905	94,265,000	41,888	44.4
1906	19,147,000	9,113	47.6
1907	19,245,000	9,141	47.5
1908	19,343,000	9,947	51.4
1909	19,442,000	9,914	51.0
1910	19,540,000	10,093	51.7
1906-1910	96,717,000	48,208	49.8
1911	19,640,000	10,282	52.4
1912	19,740,000	10,899	55.5

Source: Annual Report of the Registrar-General of Births, Deaths and Marriages in England and Wales, 1912.

Table 198
Mortality from Cancer in Spain, by Organs and Parts
Urban and Rural Districts, 1900

Organ or Part	Cities: Deaths from Cancer	Cities: Rate per 100,000 Population	Rural Districts: Deaths from Cancer	Rural Districts: Rate per 100,000 Population
Buccal cavity	158	5.2	548	3.5
Stomach and liver	413	13.6	1,797	11.5
Peritoneum, intestines and rectum	111	3.7	359	2.3
Female generative organs	436	14.3	654	4.2
Breast	49	1.6	183	1.2
Other or not specified organs	738	24.3	1,848	11.9
All organs	1,905	62.7	5,389	34.6

Population: Cities, 3,039,055, Rural Districts, 15,568,619.

Source: Dr. Hans Leyden. Bericht über die am 1. September 1902 in Spanien veranstaltete Krebssammelforschung. In: Zeitschrift für Krebsforschung, 1. Band, 1904.

APPENDIX G

Table 198a

Mortality from Cancer in Spain, by Organs and Parts, according to Sex 1901-1905

Organ or Part	Males: Deaths from Cancer	Males: Rate per 100,000 Population	Females: Deaths from Cancer	Females: Rate per 100,000 Population
Buccal cavity	1,189	2.6	286	0.6
Stomach and liver	7,719	16.9	5,809	12.0
Peritoneum, intestines, rectum	974	2.1	1,221	2.5
Female generative organs	..	..	6,100	12.6
Breast	..	..	1,548	3.2
Skin	1,053	2.3	817	1.7
Other or not specified organs	7,545	16.5	7,633	15.7
All organs	18,480	40.4	23,414	48.2

Source: La Geografía Médica de la Península Ibérica por el Dr. Ph. Hauser. Madrid, 1913.

Table 199

Mortality from Cancer in the City of Madrid, 1901-1910

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	543,005	425	78.3
1902	546,175	474	86.8
1903	549,345	500	91.0
1904	552,515	491	88.9
1905	555,685	505	90.9
1901-1905	2,746,725	2,395	87.2
1906	558,855	500	89.5
1907	562,026	524	93.2
1908	565,197	555	98.2
1909	568,368	559	98.4
1910	571,539	535	93.6
1906-1910	2,825,985	2,673	94.6

Source: Ayuntamiento de Madrid. Estadistica Demográfica, 1901-1910.

Table 200

Mortality from Cancer in Portugal 1902-1910

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1902	5,520,378	1,252	22.7
1903	5,569,001	1,306	23.5
1904	5,617,624	1,320	23.5
1905	5,666,247	1,261	22.3
1902-1905	22,373,250	5,139	23.0
1906	5,714,870	1,284	22.5
1907	5,763,493	1,246	21.6
1908	5,812,116	1,304	22.4
1909	5,860,739	1,324	22.6
1910	5,909,362	1,346	22.8
1906-1910	29,060,580	6,504	22.4

Source: Annuario Estatistico de Portugal, 1902-1905.
Letter from Instituto Central de Higiene, Lisboa.
Note: Includes Madeira and the Azores.

APPENDIX G

Table 201
Mortality from Cancer in Portugal, by Sex
1902-1910

MALES				FEMALES			
Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1902	2,619,971	547	20.9	1902	2,900,407	705	24.3
1903	2,643,048	527	19.9	1903	2,925,953	779	26.6
1904	2,666,124	553	20.7	1904	2,951,500	767	26.0
1905	2,689,201	525	19.5	1905	2,977,046	736	24.7
1902-1905	10,618,344	2,152	20.3	1902-1905	11,754,906	2,987	25.4
1906	2,711,706	493	18.2	1906	3,003,164	791	26.3
1907	2,734,777	526	19.2	1907	3,028,716	720	23.8
1908	2,757,849	573	20.8	1908	3,054,267	731	23.9
1909	2,780,921	548	19.7	1909	3,079,818	776	25.2
1910	2,803,992	575	20.5	1910	3,105,370	771	24.8
1906-1910	13,789,245	2,715	19.7	1906-1910	15,271,335	3,789	24.8

Source: Annuario Estatistico de Portugal, 1902-1905.
Letter from Instituto Central de Higiene, Lisboa.
Note: Includes Madeira and the Azores.

Table 202
Mortality from Cancer in Portugal by Provinces, 1906-1910

Province	Population	Deaths from Cancer	Rate per 100,000 Population
Entre Minho-e-Douro	6,286,343	1,222	19.4
Tras-os-Montes	2,174,830	164	7.5
Beira	7,981,530	890	11.2
Estremadura	6,910,930	2,666	38.6
Alemtejo	2,307,725	489	21.2
Algarve	1,344,795	236	17.5
Azores	1,231,717	427	34.7
Madeira	822,710	410	49.8
Total	29,060,580	6,504	22.4

Source: Letter from Instituto Central de Higiene, Lisboa.

APPENDIX G

Table 203
Cancer Census of Portugal, by Organs and Parts
1904

Organ or Part	Number of Cases: Total	Number of Cases: Males	Number of Cases: Females	Percentage: Total	Percentage: Males	Percentage: Females
Skin	224	100	124	18.9	22.4	16.7
Lips	149	129	20	12.5	28.9	2.7
Tongue	29	23	6	2.4	5.1	0.8
Stomach	104	70	34	8.8	15.7	4.6
Other digestive organs	68	42	26	5.7	9.4	3.5
Male generative organs	43	43	..	3.6	9.6	..
Breast	305	..	305	25.7	..	41.2
Uterus	159	..	159	13.4	..	21.5
Other female generative organs	26	..	26	2.2	..	3.5
Other organs	74	38	36	6.2	8.5	4.8
Not specified	7	2	5	0.6	0.4	0.7
All organs	1,188	447	741	100.0	100.0	100.0

Source: Dr. Azevedo Neves: Bericht über die Zählung der im Mai und Juni 1904 in Portugal in ärztlicher Behandlung gewesenen Krebskranken. In: Zeitschrift für Krebsforschung, 7. Band.

Note: Of 1,739 physicians, 1,307 made reply to the circular of inquiry.

Table 204
Mortality from Cancer in Porto
1893-1910

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1893	147,590	88	59.6
1894	150,500	88	58.5
1895	153,410	119	77.6
1896	156,319	96	61.4
1897	159,228	77	48.4
1898	162,137	119	73.4
1899	164,040	97	59.1
1900	166,454	96	57.7
1896-1900	808,178	485	60.0
1901	168,868	100	59.2
1902	171,282	97	56.6
1903	173,696	106	61.0
1904	176,110	109	61.9
1905	178,524	126	70.6
1901-1905	868,480	538	61.9
1906	180,938	104	57.4
1907	183,352	119	64.9
1908	185,766	101	54.4
1909	188,180	118	62.7
1910	190,594	141	74.0
1906-1910	928,830	583	62.8

Source: Annuario Estatistico de Portugal, 1902-1905.
Zeitschrift für Krebsforschung, 7. Band.
Letter from Instituto Central de Higiene, Lisboa.

Table 205
rtality from Cancer in Lisbon
1902-1910

r	Population	Deaths from Cancer	Rate per 100,000 Population
2	367,430	294	80.0
3	374,644	277	73.9
4	381,858	312	81.7
5	389,072	268	68.9
905	1,513,004	1,151	76.1
6	396,286	308	77.7
7	403,500	309	76.6
8	410,714	350	85.2
9	417,928	365	87.3
0	425,142	350	82.3
910	2,053,570	1,682	81.9

rce: Annuario Estatistico de Por-

er from Instituto Central de Higiene,

Table 206
Mortality from Cancer in Moscow by Sex, 1892-1910

Years	Average Population	Average No. of Deaths from Cancer	Rate per 100,000 Population
TOTAL			
1892-1896	960,000	763	79.5
1897-1901	1,098,000	861	78.4
1902-1905	1,251,000	994	79.5
1906-1910	1,410,000	1,161	82.3
MALES			
1892-1896	550,000	316	57.5
1897-1901	624,000	361	57.9
1902-1905	702,000	453	64.5
1906-1910	785,000	530	67.5
FEMALES			
1892-1896	410,000	447	109.0
1897-1901	474,000	500	105.5
1902-1905	549,000	541	98.5
1906-1910	625,000	631	101.0

Source: Annuaire Statistique de la ville de Moscou. Deuxième Année, 1907-1908.

Table 207
tality from Cancer in Moscow
1910-1912

	Population	Deaths from Cancer	Rate per 100,000 Population
0	1,514,595	1,415	93.4
1	1,566,164	1,478	94.4
2	1,617,733	1,559	96.4
912	4,698,492	4,452	94.8

rce: Bulletin récapitulatif de la ville
oscou publié par le Bureau de la
ique Municipale. Année, 1912.

Table 208
Mortality from Cancer in Petrograd
1911-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1911	1,935,430	1,607	83.0
1912	1,990,874	1,753	88.1
1911-1912	3,926,304	3,360	85.6

Source: Relevé succint des données statistiques sur la ville de Petrograd pour les années 1911 et 1912.
Note: With suburbs; includes only carcinoma.

Table 208a
Mortality from Cancer in the City of Warsaw, 1881-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	379,763	153	40.3
1882	382,964	232	60.6
1883	391,491	221	56.5
1884	404,889	276	68.2
1885	406,965	268	65.9
1881-1885	1,966,072	1,150	58.5
1886	431,864	260	60.2
1887	439,174	308	70.1
1888	444,814	247	55.5
1889	445,770	292	65.5
1890	455,852	281	61.6
1886-1890	2,217,474	1,388	62.6
1891	465,272	313	67.3
1892	490,417	370	75.4
1893	501,021	318	63.5
1894	515,654	332	64.4
1895	535,968	366	68.3
1891-1895	2,508,332	1,699	67.7
1896	553,643	407	73.5
1897	638,209	424	66.4
1898	654,942	443	67.6
1899	671,675	417	62.1
1900	688,408	466	67.7
1896-1900	3,206,877	2,157	67.3
1901	705,141	464	65.8
1902	721,874	523	72.5
1903	736,607	560	76.0
1904	755,340	483	63.9
1905	772,074	532	68.9
1901-1905	3,691,036	2,562	69.4
1906	783,808	500	63.8
1907	805,542	548	68.0
1908	822,276	571	69.4
1909	839,010	575	68.5
1910	855,744	547	63.9
1906-1910	4,106,380	2,741	66.7
1911	872,478	649	74.4
1912	880,222	643	72.3

Source: Statistique Démographique des Grandes Villes du Monde pendant les années 1880-1909. Amsterdam, 1911. 1910-1912, Reports of the Highest Medical Inspector for Russia.

Table 209
Mortality from Cancer in Serbia 1892-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1892	2,211,606	121	5.5
1893	2,240,270	140	6.2
1894	2,272,992	156	6.9
1895	2,312,484	128	5.5
1892-1895	9,037,352	545	6.0
1896	2,345,837	154	6.6
1897	2,384,205	167	7.0
1898	2,413,694	178	7.4
1899	2,450,392	233	9.5
1900	2,492,882	235	9.4
1896-1900	12,087,010	967	8.0
1901	2,535,956	230	9.1
1902	2,576,517	248	9.6
1903	2,621,576	238	9.1
1904	2,671,505	275	10.3
1905	2,688,747	279	10.4
1901-1905	13,094,301	1,270	9.7
1906	2,735,147	290	10.6
1907	2,784,036	371	13.3
1908	2,821,015	355	12.6
1909	2,847,891	374	13.1
1910	2,911,701	373	12.8
1906-1910	14,099,790	1,763	12.5
1911	2,960,000	394	13.3
1912	3,002,000	375	12.5

Source: Annuaire statistique du royaume de Serbie, 1896-1906.
Original data furnished by the Statistical Office of Serbia.

Table 210
Mortality from Cancer in the Cities of Serbia, 1907-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1907	426,300	159	37.3
1908	437,000	149	34.1
1909	447,700	173	38.6
1910	458,400	172	37.5
1911	469,100	168	35.8
1912	479,800	156	32.5
1907-1912	2,718,300	977	35.9

Source: Letter from the Statistical Office of Serbia.

Table 211
Mortality from Cancer in Twelve Cities of Greece, 1900-1908

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	391,158	143	36.6
1901	396,554	179	45.1
1902	401,950	176	43.8
1903	407,346	210	51.6
1904	412,742	185	44.8
1905	418,138	207	49.5
1901-1905	2,036,730	957	47.0
1906	423,534	228	53.8
1907	428,930	228	53.2
1908	434,326	252	58.0

Source: Bulletin annuel des décès de 12 villes de Grèce, 1900-1908.

Table 212
Cases of Cancer in Twelve Cities of Greece, by Organs and Parts according to Sex, 1905-1908

Organ or Part	Number of Cases			Percentage		
	Total	Males	Females	Total	Males	Females
Skin	65	49	16	9.8	14.3	5.0
Lips	53	39	14	8.0	11.4	4.4
Tongue	41	31	10	6.2	9.1	3.2
Thyroid gland	1	1	..	0.2	0.3	..
Brain	1	1	..	0.2	0.3	..
Larynx	9	9	..	1.4	2.6	..
Bronchiae	1	1	..	0.2	0.3	..
Lungs	1	1	..	0.2	0.3	..
Œsophagus	8	8	..	1.2	2.3	..
Stomach	159	117	42	24.1	34.2	13.2
Intestines	33	28	5	5.0	8.2	1.6
Pancreas	22	18	4	3.3	5.3	1.3
Liver	14	13	1	2.1	3.8	0.3
Peritoneum	1	1	..	0.2	0.3	..
Kidney	7	6	1	1.1	1.7	0.3
Bladder	18	18	..	2.7	5.3	..
Breast	79	..	79	12.0	..	24.8
Penis	1	1	..	0.2	0.3	..
Uterus	112	..	112	17.0	..	35.2
Ovaries	9	..	9	1.4	..	2.8
Vagina	25	..	25	3.8	..	7.9
All specified organs	660	342	318	100.0	100.0	100.0

Source: Dr. S. A. Gavales: Die Verbreitung der Krebskrankheit in Griechenland. In: Zeitschrift für Krebsforschung, 7. Band.

APPENDIX G

Table 213
Mortality from Cancer in Athens, by Sex
1900-1908

TOTAL				MALES			
Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	138,570	68	49.1	1900	74,232	32	43.1
1901	142,700	76	53.3	1901	76,444	35	45.8
1902	146,830	75	51.1	1902	78,657	46	58.5
1903	150,960	88	58.3	1903	80,869	48	59.4
1904	155,090	103	66.4	1904	83,082	53	63.8
1905	159,220	108	67.8	1905	85,294	57	66.8
1901-1905	754,800	450	59.6	1901-1905	404,346	239	59.1
1906	163,350	109	66.7	1906	87,507	58	66.3
1907	167,480	107	63.9	1907	89,719	48	53.5
1908	171,610	116	67.6	1908	91,931	55	59.8

FEMALES

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	64,338	36	56.0
1901	66,256	41	61.9
1902	68,173	29	42.5
1903	70,091	40	57.1
1904	72,008	50	69.4
1905	73,926	51	69.0
1901-1905	350,454	211	60.2
1906	75,843	51	67.2
1907	77,761	59	75.9
1908	79,679	61	76.6

Source: Bulletin annuel des décès de 12 villes de Grèce.

APPENDIX G

Table 214
Mortality from Cancer in the Cities of Roumania
1901-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	1,156,636	749	64.8
1902	1,172,318	748	63.8
1903	1,188,000	833	70.1
1901-1903	3,516,954	2,330	66.3

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	1,235,046	788	63.8
1907	1,250,728	709	56.7
1908	1,266,409	818	64.6
1909	1,282,090	765	59.7
1910	1,297,771	835	64.3
1906-1910	6,332,044	3,915	61.8
1911	1,313,452	813	61.9
1912	1,329,133	938	70.6

Source: Anuarul Statistic al României, 1912.
Annual Report of the Registrar-General of Births, Marriages and Deaths in England and Wales, 1912.

Table 215
Mortality from Cancer in Constantinople
1908-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1908	1,100,000	370	33.6
1909	1,125,000	391	34.8
1910	1,150,000	437	38.0
1911	1,175,000	429	36.5
1912	1,200,000	374	31.2
1908-1912	5,750,000	2,001	34.8

Source: Statistique Sanitaire de la ville de Constantinople. Années 1324 à 1328.

Table 216
Mortality from Cancer in Constantinople, by Religion
1908-1912

	Total Population	Deaths from Cancer	Rate per 100,000 Population
Mohammedans	3,460,000	782	22.6
Greeks	1,174,000	659	56.1
Armenians	532,000	294	55.3
Jews	278,000	123	44.2
Others	306,000	143	46.7
Total	5,750,000	2,001	34.8

Source: Statistique Sanitaire de la ville de Constantinople. Années 1324 à 1328.

APPENDIX G

Table 217
Mortality from Cancer in Countries of Africa

	Population	Deaths from Cancer	Rate per 100,000 Population
Algeria	3,688,433	1,257	34.1
Cape Colony	1,898,895	1,067	56.2
Mauritius	1,843,819	171	9.3
Natal	1,111,756	366	32.9
Sierra Leone	68,218	9	13.2
Transvaal	430,745	148	34.4
Total	9,041,866	3,018	33.4

Population, 1911: 1,959,645.

Note: The data are given for Algeria, 1908-1912, Europeans only; for Cape Colony, 1904-1908, twenty-five cities and towns; for Mauritius, 1906-1910; for Natal, 1908-1912, Europeans and East Indians; for Sierra Leone, 1910-1911, City of Freetown only; for Transvaal, 1909-1911, Johannesburg only.

Table 218
Mortality from Cancer in Algeria
European Population, 1904-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1904	664,674	196	29.5
1905	672,467	247	36.7
1906	680,259	227	33.4
1907	694,616	170	24.5
1908	708,973	196	27.6
1909	723,330	188	26.0
1910	737,687	239	32.4
1906-1910	3,544,865	1,020	28.8
1911	752,043	279	37.1
1912	766,400	355	46.3

Source: Statistique générale de l'Algérie.

APPENDIX G

Table 219
Mortality from Cancer in Mauritius, 1898-1912

	Population	Deaths from Cancer	Rate per 100,000 Population
	368,665	29	7.9
	368,675	50	13.6
	368,685	44	11.9
	368,695	62	16.8
	368,705	59	16.0
	368,715	50	13.6
	368,725	42	11.4
	368,735	52	14.1
905	1,843,575	265	14.4

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	368,745	35	9.5
1907	368,755	29	7.9
1908	368,764	36	9.8
1909	368,773	44	11.9
1910	368,782	27	7.3
1906-1910	1,843,819	171	9.3
1911	368,791	50	13.6
1912	368,800	36	9.8

Source: Colony of Mauritius, Annual Reports of the Registrar-General on Births, Deaths and Marriages.

Table 220
Mortality from Cancer in Mauritius Cases Treated in Public Hospitals 1898-1908

r	Cases	Deaths	Fatality Per Cent.
	22	5	22.7
	46	8	17.4
	41	11	26.8
	60	18	30.0
	47	5	10.6
	64	20	31.3
	50	11	22.0
	83	11	13.3

Year	Cases	Deaths	Fatality Per Cent.
1906	68	9	13.2
1907	57	10	17.5
1908	57	11	19.3

Source: Colony of Mauritius, Annual Reports on the Medical and Health Department.

Table 221
lity from Cancer in the Union of South Africa, by Organs and Parts according to Sex, White 1912

Organ or Part	Males: Deaths from Cancer	Males: Rate per 100,000 Population	Females: Deaths from Cancer	Females: Rate per 100,000 Population
cavity................	19	4.8	1	0.3
ch and liver..............	90	22.7	32	9.8
ieum, intestines, rectum...	18	4.6	14	4.3
generative organs.......	..	..	28	8.6
....	..	..	19	5.8
....	2	0.5	4	1.2
or not specified organs.....	59	14.9	26	8.0
ans..................	188	47.5	124	38.0

rce: Statistical Year-Book of the Union of South Africa, 1913.
te: The data include Natal, Transvaal and Orange Free State only.

APPENDIX G

Table 222

Mortality from Cancer in the Union of South Africa by Provinces, White 1912

	White Population	Deaths from Cancer	Rate per 100,000 Population
Natal	98,294	61	62.1
Transvaal	442,577	175	39.5
Orange Free State	180,994	76	42.0
Total	721,865	312	43.2

Source: Statistical Year-Book of the Union of South Africa, 1913.

Table 223

Mortality from Cancer in Cape Colony, South Africa Twenty-five Cities and Towns 1900-1908

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	334,441	200	59.8
1901	347,399	190	54.7
1902	360,357	218	60.5
1903	373,315	185	49.6
1904	386,273	193	50.0
1905	383,026	224	58.5
1901-1905	1,850,370	1,010	54.6
1906	379,779	236	62.1
1907	376,532	186	49.4
1908	373,285	228	61.1

Source: Vital Statistics of South Africa, 1900-1905. Health Reports of South Africa, 1906-1908.

Table 224

Mortality from Cancer in Johannesburg, South Africa, by Race 1909-1911

Race	Population	Deaths from Cancer	Rate per 100,000 Population
European	219,530	114	51.9
Asiatic	10,754	5	46.5
Native Black	200,461	29	14.5
Total	430,745	148	34.4

Source: Report of the Medical Officer of Health on the Public Health and Sanitary Circumstances of Johannesburg during the two years 1st July, 1909, to 30th June, 1911.

Note: According to the returns of the Transvaal Chamber of Mines, out of 3,082 deaths from all causes among the native laborers on the Rand, only five deaths, or 0.2 per cent., were attributed to malignant disease. Practically all of the deaths were medically certified.

APPENDIX G

Table 225
Mortality from Cancer in Natal, South Africa
European Population, 1902-1912

r	Population	Deaths from Cancer	Rate per 100,000 Population
2	74,600	40	53.6
3	92,000	30	32.6
4	101,183	49	48.4
5	101,170	34	33.6
.905	368,953	153	41.5

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	101,314	45	44.4
1907	99,150	57	57.5
1908	99,745	53	53.1
1909	98,934	64	64.7
1910	98,758	58	58.7
1906-1910	497,901	277	55.6
1911	98,582	63	63.9
1912	98,406	61	62.0

Source: Colony of Natal, Reports of the Health Officer.

Table 226
Mortality from Cancer in Natal, South Africa
East Indians, 1903-1912

r	Population	Deaths from Cancer	Rate per 100,000 Population
3	86,000	10	11.6
4	84,500	8	9.5
5	91,239	5	5.5
1905	261,739	23	8.8

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	98,049	5	5.1
1907	101,078	14	13.9
1908	104,120	13	12.5
1909	103,906	15	14.4
1910	122,737	13	10.6
1906-1910	529,890	60	11.3
1911	141,568	11	7.8
1912	145,000	15	10.3

Source: Colony of Natal, Reports of the Health Officer.

Table 227
Cases of Cancer in the Colonial Hospital, Sierra Leone, 1870-1909

Years	Total Admissions	Cases of Cancer	Rate per 1,000 Admissions
1870-1879	6,509	4	0.6
1880-1889	5,334	6	1.1
1890-1899	10,610	10	0.9
1900-1909	10,163	26	2.6

Source: Sierra Leone, Annual Reports on the Medical Department.

APPENDIX G

Table 228
Cases of Cancer in the Colonial Hospital, Sierra Leone, by Organs and Parts 1900-1909

Organ or Part	No. of Cases	Per Cent.
Carcinoma of œsophagus	1	3.8
Carcinoma of rectum	3	11.5
Carcinoma of uterus	3	11.5
Carcinoma of breast	10	38.5
Adenosarcoma of breast	1	3.8
Adenosarcoma of groin	1	3.8
Mellanotic sarcoma of foot	1	3.8
Sarcoma of shoulder joint	1	3.8
Sarcoma of arm	1	3.8
Sarcoma of eye	1	3.8
Chondrosarcoma of upper jaw	1	3.8
Epithelioma of tongue	1	3.8
Papilloma of bladder	1	3.8
All organs	26	100.0

Source: Sierra Leone, Annual Reports on the Medical Department.

Table 229
Mortality from Cancer in the City of Freetown, Sierra Leone, 1910-1911

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1910	34,128	3	8.8
1911	34,090	6	17.6
1910-1911	68,218	9	13.2

Source: Sierra Leone, Annual Reports on the Medical Department.

Table 230
Cases of Tumor Treated in Hospital Da Praia Cape Verde Islands, by Race 1892-1904

	White		Black		Mulatto		Total	
	Males	Females	Males	Females	Males	Females	Males	Females
Cancer	..	..	7	5	17	11	24	16
Sarcoma	2	1	..	4	3	4	5	9
Other tumors	..	..	..	4	3	11	3	15
All tumors	2	1	7	13	23	26	32	40
	3		20		49		72	

In 1904, seven persons were under treatment for cancer in the hospital of St. Vincente, Cape Verde Islands, two males and five females:

Males	Females
1 Cancer of pleura	2 Cancer of lips
1 Cancer of intestines	2 Cancer of breast
	1 Cancer of uterus

Table 231

›f Cancer Treated in Hospital da Praia, Cape Verde Islands, by Organs and Parts, according to Race and Sex, 1892-1904

	Black		Mulatto	
rt	Males	Females	Males	Females
	..	..	..	1
	1	..	1	..
›s.	1	..	3	1
	..	..	1	..
	1	..	..	..
	..	..	..	2
	..	..	1	..
	..	..	..	1
	..	1	..	3
	..	..	..	1
	..	3	..	2
	..	1	..	..
	4	..	11	..
	7	5	17	11
	12		28	

In the colony of the *Cape Verde Islands and Guinea* cancer is believed to be mon among the colored population.

colony of *St. Thomas and Principe* there has been found only one case of cancer › colored population (cancer uteri, black woman, 40 years of age).

›ola cancer is very rare, only one case is known (cancer mammae, black woman, › age).

›ambique cancer has never been found among the colored population.

›tuguese India cancer seems to be quite common, especially in *Goa*, but the sta- ta are very incomplete.

(*Portuguese China*). Cancer is rare. No cases in 1904. One man died from pharynx in 1900; one woman died, 1895, from cancer uteri spreading to rectum › urinaria; one woman died (year unknown) from cancer uteri spreading to vesica

APPENDIX G

Table 232
Mortality from Cancer in the Countries of Asia

	Population	Deaths from Cancer	Rate per 100,000 Population
Ceylon	20,076,320	1,133	5.6
Hongkong	1,737,310	140	8.1
India	4,456,200	522	11.7
Japan	242,460,425	145,965	60.2
Penang	1,391,089	143	10.3
Philippine Islands	1,190,154	325	27.3
Shanghai	68,684	38	55.3
Singapore	1,434,780	181	12.6
Total	272,814,962	148,447	54.4

Population, 1911: 57,820,460.

Note: The data are given for Ceylon, 1907-1911; for Hongkong, 1907-1911; for India, City of Calcutta, 1908-1912; for Japan, 1905-1909; for Penang, 1909-1913; for Philippine Islands, City of Manila, 1909-1913; for Shanghai, 1909-1913, Europeans only; for Singapore, 1906-1910.

Table 233
Mortality from Cancer in the City of Calcutta, India
1881-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	433,219	54	12.5
1882	458,053	44	9.6
1883	482,887	43	8.9
1884	507,721	31	6.1
1885	532,555	55	10.3
1881-1885	2,414,435	227	9.4
1886	557,389	54	9.7
1887	582,223	45	7.7
1888	607,057	63	10.4
1889	631,891	60	9.5
1890	656,725	64	9.7
1886-1890	3,035,285	286	9.4
1891	681,560	65	9.5
1892	698,184	68	9.7
1893	714,808	73	10.2
1894	731,432	71	9.7
1895	748,056	69	9.2
1891-1895	3,574,040	346	9.7
1896	764,680	57	7.5
1897	781,304	51	6.5
1898	797,927	64	8.0
1899	814,550	79	9.7
1900	831,173	72	8.7
1896-1900	3,989,634	323	8.1

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	847,796	82	9.7
1902	852,624	91	10.7
1903	857,451	90	10.5
1904	862,278	99	11.5
1905	867,105	78	9.0
1901-1905	4,287,254	440	10.3
1906	871,932	94	10.8
1907	876,759	96	10.9
1908	881,586	114	12.9
1909	886,413	80	9.0
1910	891,240	105	11.8
1906-1910	4,407,930	489	11.1
1911	896,067	98	10.9
1912	900,894	125	13.9
1913	905,721	110	12.1

Source: Report of the Health Officer of Calcutta.

Note: Without suburbs.

APPENDIX G

Table 234
ility from Cancer in the Hospitals in the Province of Bengal, India
1911-1912

	Total Number of Cases	Malignant Tumors Cases	Malignant Tumors Deaths	Cancer in Percentage of All Causes	Cancer Case Mortality per 100
	HOSPITALS IN CALCUTTA				
....	25,905	268	34	1.03	12.7
....	28,246	310	49	1.10	15.8
912................	54,151	578	83	1.07	14.4
	HOSPITALS IN BENGAL, EXCLUSIVE OF CALCUTTA				
....	46,012	381	21	0.83	5.5
....	35,130	215	16	0.61	7.4
912................	81,142	596	37	0.73	6.2
	ALL HOSPITALS IN BENGAL				
....	71,917	649	55	0.90	8.5
....	63,376	525	65	0.83	12.4
912................	135,293	1,174	120	0.87	10.2

rce: Annual Returns of the Hospitals and Dispensaries in Bengal, 1911-1912.

Table 235
Mortality from Cancer in Ceylon, 1881-1913

	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
	2,755,558	69	2.5	1901	3,582,697	213	5.9
	2,773,389	84	3.0	1902	3,636,736	219	6.0
	2,781,711	97	3.5	1903	3,690,775	212	5.7
	2,793,689	99	3.5	1904	3,744,814	190	5.1
	2,815,166	83	2.9	1905	3,798,853	207	5.4
885	13,919,513	432	3.1	1901-1905	18,453,875	1,041	5.6
	2,830,359	85	3.0	1906	3,852,892	182	4.7
	2,855,216	92	3.2	1907	3,906,931	148	3.8
	2,901,262	117	4.0	1908	3,960,970	169	4.3
	2,938,977	141	4.8	1909	4,015,009	158	3.9
	2,980,245	171	5.7	1910	4,069,048	264	6.5
890	14,506,059	606	4.2	1906-1910	19,804,850	921	4.7
	3,021,579	139	4.6	1911	4,124,362	394	9.6
	3,088,405	187	6.1	1912	4,179,676	406	9.7
	3,121,093	235	7.5	1913	4,234,990	523	12.3
	3,144,561	196	6.2				
	3,193,821	207	6.5				
895	15,569,459	964	6.2				
	3,240,501	128	4.0				
	3,315,768	177	5.3				
	3,395,519	175	5.2				
	3,429,745	191	5.6				
	3,520,574	233	6.6				
900	16,902,107	904	5.3				

Source: Ceylon, Administration Reports, Vital Statistics.

APPENDIX G

Table 236
Mortality from Cancer in Ceylon, by Organs and Parts
1911-1913

Organ or Part	Deaths from Cancer	Rate per 100,000 Population
Buccal cavity	422	3.42
Stomach and liver	334	2.71
Peritoneum, intestines and rectum	13	0.11
Female generative organs	50	0.41
Female breast	52	0.42
Skin	29	0.23
Other or not specified organs	423	3.43
All organs	1,323	10.72

Source: Ceylon: Administrative Reports, Vital Statistics.

Table 237
Mortality from Cancer in Ceylon, by Organs and Parts, according to Race
1911-1913

	Population	Buccal Cavity		Stomach and Liver	
		Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population
Europeans	22,832	..	..	3	13.14
Burghers	79,604	5	6.28	5	6.28
Sinhalese	8,033,188	332	4.13	298	3.71
Tamils	3,328,546	52	1.56	16	0.48
Moors	787,398	30	3.81	11	1.40
Malays	38,259	1	2.61	..	..
Others	51,835	2	3.86	1	1.93
Total	12,341,662	422	3.42	334	2.71

	Female Generative Organs		Breast		Skin	
	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population
Europeans	..	..	1	4.38	..	..
Burghers	5	6.28	..	..	..	..
Sinhalese	32	0.40	34	0.42	20	0.25
Tamils	11	0.33	11	0.33	6	0.18
Moors	2	0.25	5	0.64	3	0.38
Malays	..	..	1	2.61	..	..
Others	..	..	..	..	..	..
Total	50	0.41	52	0.42	29	0.23

Source: Ceylon: Administrative Reports, Vital Statistics.

APPENDIX G

Table 238
Mortality from Cancer in Ceylon, by Administrative Divisions
1911-1913

ct	Population	Deaths from Cancer	Rate per 100,000 Population
	1,982,286	343	17.3
	509,629	52	10.2
	850,752	111	13.0
	1,232,085	134	10.9
	321,912	44	13.7
Eliya	472,698	44	9.3
	886,442	104	11.7
	688,166	78	11.3
ota	323,133	40	12.4
	987,486	68	6.9
	75,519	18	23.8
vu	50,861	5	9.8
a	468,686	8	1.7
alee	89,243	13	14.6
la	911,771	31	3.4
	117,924	13	11.0
	263,532	26	9.9
pura	256,459	4	1.6
	651,463	89	13.7
a	492,131	58	11.8
	710,484	40	5.6
on	12,342,662	1,323	10.7

: Ceylon: Administrative Reports, Vital Statistics.

Table 239
Cases of Cancer in the Hospitals of Straits Settlements
1904-1912

	Admissions			Deaths		
	All Causes	Cancer	Per Cent.	All Causes	Cancer	Per Cent.
	23,717	47	0.20	3,833	25	0.65
	23,990	61	0.25	3,685	30	0.81
	24,966	55	0.22	3,832	27	0.70
	26,393	84	0.32	3,686	36	0.98
	27,913	71	0.25	4,031	38	0.94
	27,763	76	0.27	3,635	35	0.96
	32,875	93	0.28	4,500	41	0.91
)	139,910	379	0.27	19,684	177	0.90
	43,970	67	0.15	6,101	26	0.43
	38,060	85	0.22	4,581	50	1.09

e: Straits Settlements, Annual Reports on the Medical Department.

Table 240
Mortality from Cancer in Singapore
1904-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1904	253,584	30	11.8
1905	261,927	56	21.4
1906	270,270	48	17.8
1907	278,613	21	7.5
1908	286,956	26	9.1
1909	295,299	57	19.3
1910	303,642	29	9.6
1906-1910	1,434,780	181	12.6
1911	320,328	26	8.1
1912	328,671	39	11.9
1913	337,014	11	3.3

Source: Straits Settlements, Annual Reports on the Registration of Births and Deaths.

Table 241
Mortality from Cancer in the P ince of Penang, Straits Settlem
1909-1913

Year	Population	Deaths from Cancer	Ra 10 Pop
1909	272,043	19	
1910	275,023	25	
1911	278,003	29	
1912	282,176	29	
1913	284,565	38	
1909-1913	1,391,810	140	

Source: Straits Settlements, Reports on the Registration of Birt Deaths.
Note: Includes the Provinces of ley and Dindings.

Table 242
Cases of Cancer in Tan Tock Seng's Hospital, Singapore, by Organs and
1907-1912

	No. of Cases	P
Carcinoma of		
Glands of neck	28	
Lungs	7	
Œsophagus	3	
Stomach	21	
Liver	31	
Intestines	1	
Pancreas	1	
Kidney	1	
Suprarenal glands	2	
All carcinoma	95	
Sarcoma of		
Mediastinum	5	
Heart	1	
Kidney	1	
Bones	3	
All sarcoma	10	
Epithelioma of		
Jaw	1	
Tongue	2	
Pharynx	2	
Scalp	1	
Penis	4	
Arising from scars	4	
All epithelioma	14	
Glioma of brain	2	
All organs	121	

Source: Straits Settlements, Annual Reports on the Medical Department.

Table 243
nissions and Mortality from Cancer, Victoria Hospital, Seychelles
1900-1902 and 1907-1911

	Admissions			Deaths		
	All Causes	Cancer	Per Cent. of All Causes	All Causes	Cancer	Per Cent. of All Causes
....	219	2	0.9	10	2	20.0
....	249	2	0.8	17	..	..
....	266	6	2.3	14	1	7.1
12..............	734	10	1.4	41	3	7.3
....	266	2	0.8	14	..	..
....	369	2	0.5	14	..	..
....	369	4	1.1	26	1	3.8
....	460	13	2.8	30	2	6.7
....	579	7	1.2	26	2	7.7
l..............	2,043	28	1.4	110	5	4.5

ce: Selections from Colonial Medical Reports for 1900-1902.
ny of Seychelles, Blue Book.

Table 244
Admissions and Mortality from Cancer, by Organs and Parts
Victoria Hospital, Seychelles, 1907-1911

	Admissions		Deaths	
gan or Part	Number	Per Cent.	Number	Per Cent.
ı	4	14.3	1	20.0
....	1	3.6	1	20.0
....	1	3.6	..	..
....	1	3.6	..	..
....	9	32.1	2	40.0
....	2	7.1	..	..
not specified	2	7.1	1	20.0
ırcinoma..............	1	3.6	..	..
oma..................	5	17.9	..	..
....	2	7.1	..	..
ns....................	28	100.0	5	100.0

ce: Colony of Seychelles, Blue Book.

Table 245
Mortality from Cancer among Europeans in Dutch East Indies
1911-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1911	63,000	54	85.7
1912	63,000	51	81.0
1911-1912	126,000	105	83.3

Source: Handelingen der Staaten-Generaal. Bijlagen 1912-1913, 1913-1914. Nederlandsch-Indie.

APPENDIX G

Table 246
Mortality from Cancer in Hongkong, China, by Race
1901-1912

Year	Civil Europeans Population	Civil Europeans Deaths from Cancer	Civil Europeans Rate per 100,000 Population	Chinese Population	Chinese Deaths from Cancer	Chinese Rate per 100,000 Population
1901	9,560	6	62.8	280,564	21	7.5
1902	10,082	7	69.4	285,677	11	3.9
1903	10,605	2	18.9	290,790	13	4.5
1904	11,128	3	27.0	295,903	14	4.7
1905	11,651	8	68.7	301,016	20	6.6
1901-1905	53,026	26	49.0	1,453,950	79	5.4
1906	12,174	7	57.5	306,130	15	4.9
1907	12,162	7	57.6	315,862	19	6.0
1908	12,149	7	57.6	325,594	10	3.1
1909	12,136	6	49.4	335,326	24	7.2
1910	12,123	5	41.2	345,058	21	6.1
1906-1910	60,744	32	52.7	1,627,970	89	5.5
1911	12,110	5	41.3	354,790	36	10.1
1912	12,400	6	48.4	356,020	37	10.4

Source: Reports on the Health and Sanitary Condition of the Colony of Hongkong.

Table 247
Mortality from Cancer, by Organs and Parts, among the Chinese Population of Hongkong
1895-1904

Carcinoma of	Deaths from Cancer	Rate per 100,000 Population
Mouth and jaw	7	0.26
Œsophagus	3	0.11
Stomach	19	0.72
Rectum	4	0.15
Peritoneum	3	0.11
Liver	14	0.53
Skin	3	0.11
Neck	1	0.04
Breast	6	0.23
Uterus	14	0.53
Vagina	1	0.04
Bladder	1	0.04
Penis	3	0.11
Other or not specified	24	0.90
Sarcoma	16	0.60
All organs	119	4.48

Source: Correspondence relating to the Cancer Research Scheme, London, 1906.

Table 248
lty from Cancer in Shanghai a, among Resident Foreign Population, 1898-1914

	Resident Foreign Population	Deaths from Cancer	Rate per 100,000 Population
	5,938	1	16.8
	6,356	4	62.9
	6,774	5	73.8
	7,718	4	51.8
	8,662	2	23.1
	9,607	3	31.2
	10,552	3	28.4
	11,497	5	43.5
5	48,036	17	35.4
	11,904	6	50.4
	12,312	6	48.7
	12,720	8	62.9
	13,128	8	60.9
	13,536	5	36.9
0	63,600	33	51.9
	13,770	8	58.1
	14,000	8	57.1
	14,250	9	63.2
	14,300	14	97.9

: Shanghai Municipal Council,)epartment, Annual Reports.

Table 249
Mortality from Cancer in Japan 1899-1911

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1899	44,003,530	19,382	44.0
1900	44,577,790	20,334	45.6
1901	45,152,050	22,149	49.1
1902	45,726,310	24,598	53.8
1903	46,300,570	25,550	55.2
1904	46,846,690	25,993	55.5
1905	47,392,810	26,668	56.3
1901-1905	231,418,430	124,958	54.0
1906	47,938,930	27,863	58.1
1907	48,492,085	28,451	58.7
1908	49,045,240	30,440	62.1
1909	49,591,360	32,543	65.6
1910	50,137,480	32,741	65.3
1906-1910	245,205,095	152,038	62.0
1911	50,683,600	33,888	66.9

Source: Mouvement de la Population de L'Empire du Japon.

Table 248a
Surgical Cases of Malignant Tumor in the Yunghun Hospital Fukien, China, by Organs and Parts 1911-1914*

Organ or Part	Cases	Per Cent.
ıa of breast	4	30.8
ıa of glands in neck, recurrent from breast	1	7.7
ıa of ovaries	1	7.7
of abdominal wall	2	15.4
of neck glands	1	7.7
of testicle	1	7.7
of finger	1	7.7
sarcoma of tibia	1	7.7
ıma of cheek	1	7.7
ıs	13	100.0

surgical and gynecological operations performed, exclu- of operations on eyes and teeth 1,079

ns for malignant tumors in per cent. of total 1.2

:e: Annual Reports of the Yunghun Hospital, Fukien (English Presbyterian

: fiscal years.

APPENDIX G

Table 250
Mortality from Cancer in Japan, by Sex
1899-1910

MALES				FEMALES			
Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1899	22,199,781	9,780	44.1	1899	21,803,749	9,602	44.0
1900	22,493,953	10,250	45.6	1900	22,083,837	10,084	45.7
1901	22,788,240	11,050	48.5	1901	22,363,810	11,099	49.6
1902	23,082,641	12,304	53.3	1902	22,643,669	12,294	54.3
1903	23,381,788	12,972	55.5	1903	22,918,782	12,578	54.9
1904	23,666,948	13,177	55.7	1904	23,179,742	12,816	55.3
1905	23,923,890	13,564	56.7	1905	23,468,920	13,104	55.8
1901-1905	116,843,507	63,067	54.0	1901-1905	114,574,923	61,891	54.0
1906	24,180,396	14,261	59.0	1906	23,758,534	13,602	57.3
1907	24,440,011	14,411	59.0	1907	24,052,074	14,040	58.4
1908	24,708,992	15,352	62.1	1908	24,336,248	15,088	62.0
1909	24,974,209	16,602	66.5	1909	24,617,151	15,941	64.8
1910	25,249,235	16,604	65.8	1910	24,888,245	16,137	64.8
1906-1910	123,552,843	77,230	62.5	1906-1910	121,652,252	74,808	61.5

Source: Mouvement de la Population de L'Empire du Japon.

Table 251
Mortality from Cancer in Japan, by Organs and Parts, according to Sex
1909-1910

	MALES		FEMALES	
Carcinoma of	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population
Buccal cavity	1,098	2.2	429	0.9
Stomach and liver	24,331	48.4	15,530	31.4
Peritoneum, intestines rectum	1,777	3.5	1,684	3.4
Female generative organs	..	..	10,322	20.8
Breast	..	..	878	1.8
Skin	444	0.9	290	0.6
Other organs	4,328	8.6	1,888	3.8
Not specified	329	0.7	307	0.6
Other malignant tumors	899	1.8	750	1.5
All organs	33,206	66.1	32,078	64.8

Source: Statistique des causes de décès de L'Empire du Japon.

APPENDIX G

Table 252
Mortality from Cancer in Japan, by Age and Sex
1908-1910

	Population	Deaths from Cancer	Rate per 100,000 Population
MALES			
25	38,732,576	378	1.0
	11,607,034	670	5.8
	8,729,629	3,202	36.7
	6,856,318	10,333	150.7
	5,417,615	18,737	345.9
	2,577,676	12,107	469.7
over	1,011,588	3,131	309.5
s	74,932,436	48,558	64.8
FEMALES			
25	37,873,379	450	1.2
	11,423,302	2,154	18.9
	8,336,722	6,288	75.4
	6,564,522	10,797	164.5
	5,419,977	14,698	271.2
	2,894,592	9,436	326.0
over	1,329,150	3,343	251.5
s	73,841,644	47,166	63.9

rce: Statistique des causes de décès de L'Empire du Japon.

Table 253
Mortality from Cancer in Tokyo
1904-1910

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1904	1,400,000	1,074	76.7
1905	1,459,000	1,071	73.4
1906	1,523,000	1,107	72.7
1907	1,580,000	1,111	70.3
1908	1,601,000	1,191	74.4
1909	1,623,079	1,225	75.5
1910	1,805,800	1,284	71.1
1906-1910	8,132,879	5,918	72.8

Source: Tenth Annual Statistics of the City of Tokyo, 1913.

APPENDIX G

Table 254
Mortality from Cancer in Tokyo, by Sex
1904-1910

MALES				FEMALES			
Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1904	778,000	555	71.3	1904	622,000	519	83.4
1905	811,000	549	67.7	1905	648,000	522	80.6
1906	846,000	576	68.1	1906	677,000	531	78.4
1907	878,000	602	68.6	1907	702,000	509	72.5
1908	890,000	604	67.9	1908	711,000	587	82.6
1909	902,433	627	69.5	1909	720,646	598	83.0
1910	1,004,025	646	64.3	1910	801,775	638	79.6
1906-1910	4,520,458	3,055	67.6	1906-1910	3,612,421	2,863	79.3

Source: Tenth Annual Statistics of the City of Tokyo, 1913.

Table 255
Mortality from Cancer in Osaka, by Sex
1906-1910

TOTAL				MALES			
Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	1,134,332	625	55.1	1906	621,047	309	49.8
1907	1,180,461	587	49.7	1907	646,302	292	45.2
1908	1,226,590	655	53.4	1908	671,558	312	46.5
1909	1,232,982	698	56.6	1909	675,058	361	53.5
1910	1,250,000	739	59.1	1910	685,000	379	55.3
1906-1910	6,024,365	3,304	54.8	1906-1910	3,298,965	1,653	50.1

FEMALES			
Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	513,285	316	61.6
1907	534,159	295	55.2
1908	555,032	343	61.8
1909	557,924	337	60.4
1910	565,000	360	63.7
1906-1910	2,725,400	1,651	60.6

Source: Mouvement de la Population de L'Empire du Japon, 1906-1910.

Table 256

ality from Cancer in Kyoto by Sex

1906-1910

	Population	Deaths from Cancer	Rate per 100,000 Population
	TOTAL		
	417,704	381	91.2
	430,083	412	95.8
	442,462	381	86.1
	456,247	436	95.6
	470,000	376	80.8
10	2,216,496	1,986	89.6
	MALES		
	215,285	218	101.3
	221,665	224	101.1
	228,045	203	89.0
	235,150	226	96.1
	242,050	201	83.0
10	1,142,195	1,072	93.9
	FEMALES		
	202,419	163	80.5
	208,418	188	90.2
	214,417	178	83.0
	221,097	210	95.0
	227,950	175	76.8
10	1,074,301	914	85.1

:e: Mouvement de la Population npire du Japon, 1906-1910.

Table 257

Mortality from Cancer in Manila Philippine Islands

1903-1913

Year (Ending June 30)	Population	Deaths from Cancer	Rate per 100,000 Population
1903	219,941	29	13.2
1904	220,841	28	12.7
1905	221,741	35	15.8
1906	222,641	38	17.1
1907	223,542	52	23.3
1908	227,164	63	27.7
1909	230,786	64	27.7
1910	234,409	72	30.7
1906-1910	1,138,542	289	25.4
1911	238,031	68	28.6
1912	241,653	63	26.1
1913	245,275	58	23.6

Source: Annual Reports of the Bureau of Health for the Philippine Islands.

Table 258

Mortality from Cancer in Manila, by Organs and Parts according to Race

1908-1913

Organ or Part	White Race: Deaths from Cancer	White Race: Rate per 100,000 Population	Filipinos: Deaths from Cancer	Filipinos: Rate per 100,000 Population	Chinese: Deaths from Cancer	Chinese: Rate per 100,000 Population
cavity................	2	5.1	43	4.0	3	4.7
h and liver...........	9	22.8	59	5.4	5	7.8
eum, intestines, rectum	..	..	22	2.0	..	..
generative organs.....	4	10.1	53	4.9	..	..
....	..	..	25	2.3	..	..
....	..	..	9	0.8	..	..
r not specified........	5	12.6	82	7.6	4	6.3
ıus..................	20	50.6	293	27.0	12	18.8

rce: Annual Reports of the Bureau of Health for the Philippine Islands.

Table 259
Mortality from Cancer in the Countries of Australasia

	Population	Deaths from Cancer	Rate per 100,000 Population
Hawaii	962,860	392	40.7
New South Wales	8,142,200	5,948	73.1
New Zealand	4,963,912	3,731	75.2
Northern Territory	6,678	3	44.9
Queensland	2,961,089	1,870	63.2
South Australia	1,996,995	1,525	76.4
Tasmania	950,717	621	65.3
Victoria	6,521,936	5,441	83.4
Western Australia	1,380,353	814	59.0
Total	27,886,740	20,345	73.0

Population, 1911: 5,703,425.

Note: The data are given for Hawaii, 1908-1912, for New South Wales, 1908-1912, for New Zealand, 1908-1912, for Northern Territory, 1911-1912, for Queensland, 1908-1912, for South Australia, 1908-1912, for Tasmania, 1908-1912, for Victoria, 1908-1912, for Western Australia, 1908-1912.

Table 260
Mortality from Cancer in the Commonwealth of Australia
1881-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	2,269,135	784	34.6
1882	2,347,410	800	34.1
1883	2,446,910	896	36.6
1884	2,555,731	956	37.4
1885	2,650,123	942	35.5
1881-1885	12,269,309	4,378	35.7
1886	2,741,286	1,097	40.0
1887	2,834,708	1,156	40.8
1888	2,931,521	1,215	41.4
1889	3,022,077	1,375	45.5
1890	3,106,917	1,358	43.7
1886-1890	14,636,509	6,201	42.4
1891	3,196,172	1,593	49.8
1892	3,273,371	1,557	47.6
1893	3,333,825	1,613	48.4
1894	3,394,328	1,681	49.5
1895	3,459,192	1,771	51.2
1891-1895	16,656,888	8,215	49.3
1896	3,522,362	1,904	54.1
1897	3,585,442	1,971	55.0
1898	3,641,251	2,145	58.9
1899	3,690,353	2,200	59.6
1900	3,740,665	2,341	62.6
1896-1900	18,180,073	10,561	58.1
1901	3,790,710	2,401	63.3
1902	3,847,998	2,467	64.1
1903	3,893,329	2,396	61.5
1904	3,942,730	2,371	60.1
1905	4,001,117	2,539	63.5
1901-1905	19,475,884	12,174	62.5
1906	4,060,324	2,608	64.2
1907	4,123,729	2,940	71.3
1908	4,194,410	2,921	69.6
1909	4,274,617	3,112	72.8
1910	4,370,185	3,205	73.3
1906-1910	21,023,265	14,786	70.3
1911	4,490,366	3,321	74.0
1912	4,644,852	3,537	76.1
1913	4,803,661	3,603	75.0

Source: Annual Reports of the Registrar-General of Births, Deaths and Marriages in England and Wales.
Official Statistics, Commonwealth of Australia. Annual Bulletins of Commonwealth Demography.

APPENDIX G

Table 261
Mortality from Cancer in the Commonwealth of Australia by Organs and Parts, according to Sex 1908-1912

Organ or Part	MALES Deaths from Cancer	MALES Rate per 100,000 Population	FEMALES Deaths from Cancer	FEMALES Rate per 100,000 Population
....	153	1.3	11	0.1
....	452	4.0	21	0.2
....	117	1.0	10	0.1
....	380	3.3	61	0.6
x......................	248	2.2	25	0.2
gus..................	242	2.1	51	0.5
h......................	2,254	19.7	1,246	11.8
id gall-bladder..........	1,045	9.2	1,024	9.7
eum and mesentery......	36	0.3	45	0.4
es.....................	605	5.3	640	6.1
....	292	2.5	268	2.5
s......................	172	1.5	101	0.9
nd fallopian tube........	..	..	118	1.0
....	..	..	1,456	13.8
....	11	0.1	1,117	10.6
....	335	2.9	157	1.5
....	121	1.1	15	0.1
nd pleura..............	99	0.9	58	0.5
and suprarenal glands...	98	0.9	54	0.5
....	172	1.5	60	0.6
....	170	1.5	..	..
....	17	0.1	20	0.2
rgans..................	889	7.9	600	5.7
cified..................	517	4.5	513	4.8
ns......................	8,425	73.8	7,671	72.6

es, 45 years and over, 20.11 per cent. of population. Females, 45 years and over, oer cent. of population.

ce: Official Statistics, Commonwealth of Australia. Annual Bulletins of Com-lth Demography.

APPENDIX G

Table 262

Mortality from Cancer in the Commonwealth of Australia, by Age and Sex 1908-1912

Ages	Population	Deaths from Cancer	Rate per 100,000 Population
MALES			
Under 25	5,791,262	191	3.3
25–34	1,840,288	157	8.5
35–44	1,471,775	571	38.8
45–54	1,195,675	1,643	137.4
55–64	612,669	2,095	341.9
65–74	343,414	2,401	699.2
75 and over	154,023	1,356	880.4
Not stated	..	11	..
All ages	11,409,106	8,425	73.8
FEMALES			
Under 25	5,622,866	149	2.6
25–34	1,726,374	249	14.4
35–44	1,310,100	948	72.4
45–54	958,275	1,688	176.1
55–64	500,796	1,746	348.6
65–74	309,564	1,763	569.5
75 and over	137,349	1,126	819.8
Not stated	..	2	..
All ages	10,565,324	7,671	72.6

Source: Official Statistics, Commonwealth of Australia. Annual Bulletins of Commonwealth Demography.

APPENDIX G

Table 263
Mortality from Cancer in New South Wales
1881-1913

	Population	Deaths from Cancer	Rate per 100,000 Population
1	765,015	216	28.2
2	798,540	215	26.9
3	838,155	215	25.7
4	883,145	233	26.4
5	927,275	267	28.8
885	4,212,130	1,146	27.2
6	969,455	333	34.3
7	1,004,835	354	35.2
8	1,035,705	404	39.0
9	1,066,450	393	36.9
0	1,101,840	392	35.6
890	5,178,285	1,876	36.2
1	1,142,025	516	45.2
2	1,176,990	510	43.3
3	1,203,170	489	40.6
4	1,226,900	516	42.1
5	1,250,760	556	44.5
895	5,999,845	2,587	43.1
6	1,270,620	627	49.3
7	1,290,375	693	53.7
8	1,312,455	714	54.4
9	1,333,605	761	57.1
0	1,354,335	765	56.5
900	6,561,390	3,560	54.3
1	1,366,900	847	62.0
2	1,388,400	869	62.6
3	1,407,400	930	66.1
4	1,428,700	954	66.8
5	1,454,800	965	66.3
905	7,046,200	4,565	64.8

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	1,484,600	1,027	69.2
1907	1,517,900	1,085	71.5
1908	1,545,700	1,058	68.4
1909	1,577,200	1,166	73.9
1910	1,616,200	1,179	72.9
1906-1910	7,741,600	5,515	71.2
1911	1,664,500	1,233	74.1
1912	1,738,600	1,312	75.5
1913	1,809,400	1,332	73.6

Source: Vital Statistics of New South Wales, 1881-1913.

Table 264
Mortality from Cancer in New South Wales, Males, 1881-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	419,025	120	28.6
1882	438,060	118	26.9
1883	460,540	124	26.9
1884	486,145	123	25.3
1885	510,670	148	29.0
1881-1885	2,314,440	633	27.4
1886	533,145	171	32.1
1887	550,805	209	37.9
1888	565,770	208	36.8
1889	581,100	217	37.3
1890	599,330	229	38.2
1886-1890	2,830,150	1,034	36.5
1891	618,847	297	48.0
1892	634,790	269	42.4
1893	646,650	250	38.7
1894	657,420	308	46.8
1895	667,800	311	46.6
1891-1895	3,225,507	1,435	44.5
1896	676,350	333	49.2
1897	686,137	369	53.8
1898	696,952	398	57.1
1899	706,167	410	58.1
1900	714,757	409	57.2
1896-1900	3,480,363	1,919	55.1
1901	716,300	484	67.6
1902	725,700	500	68.9
1903	733,800	492	67.0
1904	744,300	457	61.4
1905	757,900	525	69.3
1901-1905	3,678,000	2,458	66.8
1906	772,800	520	67.3
1907	789,400	632	80.1
1908	801,900	537	67.0
1909	818,200	608	74.3
1910	840,100	623	74.2
1906-1910	4,022,400	2,920	72.6
1911	868,300	666	76.7
1912	913,100	726	79.5
1913	951,200	739	77.7

Source: Vital Statistics for 1913 and previous years, New South Wales.

Table 265
Mortality from Cancer in New South Wales, Females, 1881-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	345,990	96	27.7
1882	360,480	97	26.9
1883	377,615	91	24.1
1884	397,000	110	27.7
1885	416,605	119	28.6
1881-1885	1,897,690	513	27.0
1886	436,310	162	37.1
1887	454,030	145	31.9
1888	469,935	196	41.7
1889	485,350	176	36.3
1890	502,510	163	32.4
1886-1890	2,348,135	842	35.9
1891	523,178	219	41.9
1892	542,200	241	44.4
1893	556,520	239	42.9
1894	569,480	208	36.5
1895	582,960	245	42.0
1891-1895	2,774,338	1,152	41.5
1896	594,270	294	49.5
1897	604,238	324	53.6
1898	615,503	316	51.3
1899	627,438	351	55.9
1900	639,578	356	55.7
1896-1900	3,081,027	1,641	53.3
1901	650,600	363	55.8
1902	662,700	369	55.7
1903	673,600	438	65.0
1904	684,400	497	72.6
1905	696,900	440	63.1
1901-1905	3,368,200	2,107	62.6
1906	711,800	507	71.2
1907	728,500	453	62.2
1908	743,800	521	70.0
1909	759,000	558	73.5
1910	776,100	556	71.6
1906-1910	3,719,200	2,595	69.8
1911	796,200	567	71.2
1912	825,500	586	71.0
1913	858,200	593	69.1

Source: Vital Statistics for 1913 and previous years, New South Wales.

APPENDIX G

Table 266
Mortality from Cancer in New South Wales, by Age and Sex
1881-1911

	1881-1890	1891-1900	1901-1910	1911
	TOTAL			
	RATE PER 100,000 POPULATION			
....	10.1	10.7	11.2	13.0
....	38.2	49.6	53.9	54.6
....	113.7	145.2	154.1	167.5
....	210.9	315.2	356.5	345.9
....	336.3	471.8	677.1	672.7
over..........................	392.4	634.3	834.9	945.2
s.............................	32.2	48.8	67.7	74.2
	MALES			
....	7.5	9.4	8.9	11.9
....	28.8	36.3	39.3	45.5
....	93.6	121.3	125.3	141.9
....	119.5	303.6	349.6	355.6
....	347.8	513.2	720.0	741.4
over..........................	412.4	637.8	863.6	888.9
s.............................	32.4	49.9	69.0	76.8
	FEMALES			
....	13.6	12.4	13.7	14.2
....	52.5	67.9	71.6	65.0
....	146.3	179.3	192.1	200.3
....	228.8	332.0	365.4	333.5
....	318.5	430.0	620.6	589.8
over..........................	359.7	629.5	799.8	1,015.1
s.............................	31.9	47.7	66.2	71.3

rce: The Official Year Book of New South Wales, 1913.

Table 267
Mortality from Cancer in Sydney New South Wales 1891-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	389,655	210	53.9
1892	406,540	244	60.0
1893	418,865	189	45.1
1894	429,410	199	46.3
1895	440,020	185	42.0
1891-1895	2,084,490	1,027	49.3
1896	448,850	269	59.9
1897	457,630	303	66.2
1898	467,445	326	69.7
1899	476,850	353	74.0
1900	486,070	326	67.1
1896-1900	2,336,845	1,577	67.5
1901	493,810	358	72.5
1902	506,765	392	77.4
1903	518,960	377	72.6
1904	524,695	382	72.8
1905	530,655	435	82.0
1901-1905	2,574,885	1,944	75.5
1906	545,065	481	88.2
1907	567,005	493	86.9
1908	584,640	493	84.3
1909	599,000	571	95.3
1910	613,500	548	89.3
1906-1910	2,909,210	2,586	88.9
1911	639,515	572	89.4
1912	675,800	621	91.9
1913	710,100	677	95.3

Source: New South Wales, Vital Statistics, Annual Reports, 1891-1913.
Government Statistician's Reports on the Vital Statistics of Sydney and Suburbs, 1911-1912.

Table 268
Mortality from Cancer in Sydney Males, 1891-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	196,932	113	57.4
1892	205,059	110	53.6
1893	210,857	86	40.8
1894	215,736	100	46.4
1895	220,626	88	39.9
1891-1895	1,049,210	497	47.4
1896	224,605	125	55.7
1897	228,540	157	68.7
1898	232,975	149	64.0
1899	237,185	177	74.6
1900	241,285	148	61.3
1896-1900	1,164,590	756	64.9
1901	244,633	172	70.3
1902	250,798	193	77.0
1903	256,574	170	66.3
1904	259,147	155	59.8
1905	261,825	212	81.0
1901-1905	1,272,977	902	70.9
1906	268,663	215	80.0
1907	279,193	280	100.3
1908	287,584	231	80.3
1909	294,349	280	95.1
1910	301,167	271	90.0
1906-1910	1,430,956	1,277	89.2
1911	310,593	265	85.3
1912	328,216	301	91.7
1913	344,874	328	95.1

Source: New South Wales, Vital Statistics, Annual Reports, 1891-1913.
Government Statistician's Reports on the Vital Statistics of Sydney and Suburbs, 1911-1912.

Table 269

ity from Cancer in Sydney

Females, 1891-1913

Population	Deaths from Cancer	Rate per 100,000 Population
192,723	97	50.3
201,481	134	66.5
208,008	103	49.5
213,674	99	46.3
219,394	97	44.2
1,035,280	530	51.2
224,245	144	64.2
229,090	146	63.7
234,470	177	75.5
239,665	176	73.4
244,785	178	72.7
1,172,255	821	70.0
249,177	186	74.6
255,967	199	77.7
262,386	207	78.9
265,548	227	85.5
268,830	223	83.0
1,301,908	1,042	80.0
276,402	266	96.2
287,812	213	74.0
297,056	262	88.2
304,651	291	95.5
312,333	277	88.7
1,478,254	1,309	88.6
328,922	307	93.3
347,584	320	92.1
365,226	349	95.6

New South Wales, Vital Sta-
nual Reports, 1891-1913.
nent Statistician's Reports on
tatistics of Sydney and Suburbs,

Table 270

Mortality from Cancer in Victoria

1881-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	866,285	351	40.5
1882	883,365	373	42.2
1883	902,609	450	49.9
1884	924,115	446	48.3
1885	947,808	445	47.0
1881-1885	4,524,182	2,065	45.6
1886	976,778	496	50.8
1887	1,009,597	527	52.2
1888	1,052,277	521	49.5
1889	1,092,008	629	57.6
1890	1,119,333	626	55.9
1886-1890	5,249,993	2,799	53.3
1891	1,146,050	699	61.0
1892	1,163,560	684	58.8
1893	1,172,459	734	62.6
1894	1,179,163	744	63.1
1895	1,183,916	760	64.2
1891-1895	5,845,148	3,621	61.9
1896	1,182,763	789	66.7
1897	1,180,978	774	65.5
1898	1,182,194	864	73.1
1899	1,185,411	842	71.0
1900	1,192,377	817	68.5
1896-1900	5,923,723	4,086	69.0
1901	1,204,909	882	73.2
1902	1,214,226	852	70.2
1903	1,215,521	920	75.7
1904	1,216,905	893	73.4
1905	1,223,796	953	77.9
1901-1905	6,075,357	4,500	74.1
1906	1,236,729	926	74.9
1907	1,252,471	992	79.2
1908	1,265,782	1,005	79.4
1909	1,281,058	1,030	80.4
1910	1,299,565	1,081	83.2
1906-1910	6,335,605	5,034	79.5
1911	1,321,212	1,100	83.3
1912	1,354,319	1,225	90.3
1913	1,393,180	1,164	83.5

Source: Statistical Register of Victoria for 1912.
Official Statistics, Commonwealth of Australia, Commonwealth Demography, 1913.

Table 271
Mortality from Cancer in Victoria
Males, 1881-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	454,170	172	37.9
1882	462,285	208	45.0
1883	472,230	234	49.6
1884	483,968	221	45.7
1885	497,182	234	47.1
1881-1885	2,369,835	1,069	45.1
1886	513,981	247	48.1
1887	532,540	275	51.6
1888	556,321	276	49.6
1889	577,049	324	56.1
1890	589,096	338	57.4
1886-1890	2,768,987	1,460	52.7
1891	600,957	407	67.7
1892	607,531	359	59.1
1893	609,083	406	66.7
1894	609,440	375	61.5
1895	608,656	418	68.7
1891-1895	3,035,667	1,965	64.7
1896	603,715	422	69.9
1897	599,559	396	66.0
1898	598,977	445	74.3
1899	599,048	444	74.1
1900	600,769	435	72.4
1896-1900	3,002,068	2,142	71.4
1901	606,129	483	79.7
1902	608,437	444	73.0
1903	607,250	487	80.2
1904	606,432	453	74.7
1905	609,903	498	81.7
1901-1905	3,038,151	2,365	77.8
1906	616,262	466	75.6
1907	623,643	499	80.0
1908	630,461	497	78.8
1909	638,671	530	83.0
1910	648,028	564	87.0
1906-1910	3,157,065	2,556	81.0
1911	660,038	535	81.1
1912	675,534	572	84.7
1913	695,638	574	82.5

Source: Statistical Register of Victoria for 1912.
Official Statistics, Commonwealth of Australia, Commonwealth Demography, 1913.

Table 272
Mortality from Cancer in Victoria
Females, 1881-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	412,115	179	43.4
1882	421,080	165	39.2
1883	430,379	216	50.2
1884	440,147	225	51.1
1885	450,626	211	46.8
1881-1885	2,154,347	996	46.2
1886	462,797	249	53.8
1887	477,057	252	52.8
1888	495,956	245	49.4
1889	514,959	305	59.2
1890	530,237	288	54.3
1886-1890	2,481,006	1,339	54.0
1891	545,093	292	53.6
1892	556,029	325	58.5
1893	563,376	328	58.2
1894	569,723	369	64.8
1895	575,260	342	59.5
1891-1895	2,809,481	1,656	58.9
1896	579,048	367	63.4
1897	581,419	378	65.0
1898	583,217	419	71.8
1899	586,363	398	67.9
1900	591,608	382	64.6
1896-1900	2,921,655	1,944	66.5
1901	598,780	399	66.6
1902	605,789	408	67.4
1903	608,271	433	71.2
1904	610,473	440	72.1
1905	613,893	455	74.1
1901-1905	3,037,206	2,135	70.3
1906	620,467	460	74.1
1907	628,828	493	78.4
1908	635,321	508	80.0
1909	642,387	500	77.8
1910	651,537	517	79.4
1906-1910	3,178,540	2,478	78.0
1911	661,174	565	85.5
1912	678,785	653	96.2
1913	697,542	590	84.6

Source: Statistical Register of Victoria for 1912.
Official Statistics, Commonwealth of Australia, Commonwealth Demography, 1913.

APPENDIX G

Table 273

Mortality from Cancer in Victoria, by Age and Sex 1880-1882, 1890-1892, 1900-1902, 1909-1911 Rate per 100,000 of Population

Ages	1880-1882	1890-1892	1900-1902	1909-1911
		MALES		
Under 5	2.9	1.8	3.0	6.4
5– 9	2.4	1.0	4.2	2.0
10–14	1.8	1.1	2.0	1.6
15–19	0.7	1.7	2.2	2.4
20–24	2.5	3.2	3.3	4.3
25–34	8.0	8.1	12.6	8.6
35–44	41.2	42.9	36.9	35.8
45–54	101.6	148.3	141.4	158.5
55–64	220.1	319.2	360.0	355.6
65–74	345.5	527.5	590.4	733.6
75 and over	451.2	585.5	740.4	852.5
All ages	42.9	61.6	75.2	83.6
		FEMALES		
Under 5	1.2	0.9	2.6	1.4
5– 9	1.2	1.0	0.4	0.5
10–14	0.6	0.6	..	2.1
15–19	2.6	1.2	2.8	4.4
20–24	3.9	2.2	2.3	3.5
25–34	26.5	16.8	16.1	13.7
35–44	73.2	74.3	60.5	72.9
45–54	150.7	180.0	181.3	162.3
55–64	293.5	317.9	330.5	330.1
65–74	326.8	539.6	500.8	574.1
75 and over	275.6	495.5	627.0	774.9
All ages	42.7	55.7	66.4	80.7

Source: Victorian Year-book, 1911-1912.

Table 274
Mortality from Cancer in South Australia, 881-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	277,695	91	32.8
1882	285,400	89	31.2
1883	293,223	86	29.3
1884	301,505	109	36.2
1885	305,063	100	32.8
1881-1885	1,462,886	475	32.5
1886	303,800	104	34.2
1887	304,017	110	36.2
1888	305,244	116	38.0
1889	307,374	133	43.3
1890	311,976	129	41.3
1886-1890	1,532,411	592	38.6
1891	316,897	156	49.2
1892	325,128	148	45.5
1893	335,233	171	51.0
1894	341,932	162	47.4
1895	345,466	166	48.1
1891-1895	1,664,656	803	48.2
1896	344,810	186	53.9
1897	344,313	185	53.7
1898	346,854	184	53.0
1899	351,658	203	57.7
1900	354,268	210	59.3
1896-1900	1,741,903	968	55.6
1901	357,556	216	60.4
1902	355,934	267	75.0
1903	355,437	261	73.4
1904	356,968	226	63.3
1905	359,940	249	69.2
1901-1905	1,785,835	1,219	68.3
1906	363,110	279	76.8
1907	367,710	270	73.4
1908	377,994	270	71.4
1909	388,439	310	79.8
1910	397,700	317	79.7
1906-1910	1,894,953	1,446	76.3
1911	411,218	303	73.7
1912	421,644	325	77.1
1913	433,588	362	83.5

Source: Vital Statistics of South Australia.

Table 275
Mortality from Cancer in South Australia, Males, 1882-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1882	150,325	52	34.6
1883	153,767	47	30.6
1884	157,812	58	36.8
1885	159,106	52	32.7
1882-1885	621,010	209	33.7
1886	157,758	46	29.2
1887	157,606	59	37.4
1888	157,303	49	31.2
1889	158,025	67	42.4
1890	160,695	68	42.3
1886-1890	791,387	289	36.5
1891	162,950	86	52.8
1892	167,385	87	52.0
1893	172,925	88	50.9
1894	175,642	83	47.3
1895	175,901	86	48.9
1891-1895	854,803	430	50.3
1896	173,578	98	56.5
1897	172,545	107	62.0
1898	173,897	95	54.6
1899	177,145	104	58.7
1900	178,729	103	57.6
1896-1900	875,894	507	57.9
1901	180,003	105	58.3
1902	177,529	126	71.0
1903	176,254	133	75.5
1904	176,586	112	63.4
1905	179,182	118	65.9
1901-1905	889,554	594	66.8
1906	182,334	139	76.2
1907	184,864	134	72.5
1908	190,524	139	73.0
1909	196,553	154	78.4
1910	201,344	158	78.5
1906-1910	955,619	724	75.8
1911	208,923	148	70.8
1912	214,416	173	80.7
1913	219,605	181	82.4

Source: Vital Statistics of South Australia.

Table 276
rtality from Cancer in South ustralia, Females, 1882-1913

r	Population	Deaths from Cancer	Rate per 100,000 Population
2	135,075	37	27.4
3	139,456	39	28.0
4	143,693	51	35.5
5	145,957	48	32.9
885	564,181	175	31.0
6	146,042	58	39.7
7	146,411	51	34.8
8	147,941	67	45.3
9	149,349	66	44.2
0	151,281	61	40.3
890	741,024	303	40.9
1	153,947	70	45.5
2	157,743	61	38.7
3	162,308	83	51.1
4	166,290	79	47.5
5	169,565	80	47.2
895	809,853	373	46.1
6	171,232	88	51.4
7	171,768	78	45.4
8	172,957	89	51.5
9	174,513	99	56.7
0	175,539	107	61.0
900	866,009	461	53.2
1	177,553	111	62.5
2	178,405	141	79.0
3	179,183	128	71.4
4	180,382	114	63.2
5	180,758	131	72.5
905	896,281	625	69.7
6	180,776	140	77.4
7	182,846	136	74.4
8	187,470	131	69.9
9	191,886	156	81.3
0	196,356	159	81.0
910	939,334	722	76.9
1	202,295	155	76.6
2	207,228	152	73.3
3	213,983	181	84.6

rce: Vital Statistics of South Aus-

Table 277
Mortality from Cancer in Queensland 1881-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	216,445	65	30.0
1882	232,089	54	23.3
1883	261,472	70	26.8
1884	291,101	94	32.3
1885	309,134	53	17.1
1881-1885	1,310,241	336	25.6
1886	324,496	92	28.4
1887	342,096	81	23.7
1888	359,523	88	24.5
1889	374,327	130	34.7
1890	386,803	117	30.2
1886-1890	1,787,245	508	28.4
1891	396,256	134	33.8
1892	405,036	130	32.1
1893	414,335	121	29.2
1894	424,492	157	37.0
1895	436,528	189	43.3
1891-1895	2,076,647	731	35.2
1896	447,885	183	40.9
1897	458,000	187	40.8
1898	469,078	229	48.8
1899	480,588	243	50.6
1900	490,081	229	46.7
1896-1900	2,345,632	1,071	45.7
1901	501,432	278	55.4
1902	510,450	285	55.8
1903	514,483	252	49.0
1904	521,815	297	56.9
1905	528,928	351	66.4
1901-1905	2,577,108	1,463	56.8
1906	536,200	292	54.5
1907	542,730	353	65.0
1908	553,619	337	60.9
1909	569,950	341	59.8
1910	591,591	395	66.8
1906-1910	2,794,090	1,718	61.5
1911	614,352	398	64.8
1912	631,577	399	63.2
1913	652,555	426	65.3

Source: Vital Statistics of Queensland.

APPENDIX G

Table 278
Mortality from Cancer in Queensland, Males
1893-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1893	233,571	85	36.4	1906	293,645	167	56.9
1894	238,940	88	36.8	1907	295,349	204	69.1
1895	245,385	114	46.5	1908	301,323	189	62.7
				1909	310,400	193	62.2
1896	250,989	107	42.6	1910	322,268	233	72.3
1897	255,887	102	39.9				
1898	262,153	138	52.6	1906-1910	1,522,985	986	64.7
1899	268,767	151	56.2				
1900	273,288	130	47.6	1911	334,542	242	72.3
				1912	342,663	224	65.4
1896-1900	1,311,084	628	47.9	1913	353,625	252	71.3
1901	279,075	163	58.4				
1902	283,934	170	59.9				
1903	285,176	156	54.7				
1904	288,715	169	58.5				
1905	291,149	196	67.3				
1901-1905	1,428,049	854	59.8				

Source: Vital Statistics of Queensland.

Table 279
Mortality from Cancer in Queensland, Females
1893-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1893	180,764	36	19.9	1906	242,555	125	51.5
1894	185,552	69	37.2	1907	247,381	149	60.2
1895	191,143	75	39.2	1908	252,296	148	58.7
				1909	259,550	148	57.0
1896	196,896	76	38.6	1910	269,323	162	60.2
1897	202,113	85	42.1				
1898	206,925	91	44.0	1906-1910	1,271,105	732	57.6
1899	211,821	92	43.4				
1900	216,793	99	45.7	1911	279,810	156	55.8
				1912	288,914	175	60.6
1896-1900	1,034,548	443	42.8	1913	298,930	174	58.2
1901	222,357	115	51.7				
1902	226,516	115	50.8				
1903	229,307	96	41.9				
1904	233,100	128	54.9				
1905	237,779	155	65.2				
1901-1905	1,149,059	609	53.0				

Source: Vital Statistics of Queensland.

Table 280
Mortality from Cancer in Tasmania, 1884-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
	124,971	65	52.0
	127,763	60	47.0
	130,025	57	43.8
	133,366	67	50.2
	136,709	68	49.7
	139,769	70	50.1
	143,224	79	55.2
90	683,093	341	49.9
	147,969	68	46.0
	150,681	69	45.8
	150,304	79	52.6
	151,451	80	52.8
	153,701	75	48.8
95	754,106	371	49.2
	157,096	95	60.5
	161,629	81	50.1
	166,200	99	59.6
	170,400	91	53.4
	172,631	93	53.9
00	827,956	459	55.4

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	172,525	95	55.1
1902	175,173	109	62.2
1903	180,375	100	55.4
1904	183,007	93	50.8
1905	184,478	97	52.6
1901-1905	895,558	494	55.2
1906	184,272	94	51.0
1907	184,791	112	60.6
1908	187,485	123	65.6
1909	190,227	124	65.2
1910	191,005	123	64.4
1906-1910	937,780	576	61.4
1911	190,316	119	62.5
1912	191,684	132	68.9
1913	195,986	144	73.5

Source: Statistics of Tasmania. Official Statistics, Commonwealth of Australia, Commonwealth Demography, 1913.

Table 281
Mortality from Cancer in Tasmania, Males, 1892-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
	79,846	34	42.6
	79,267	40	50.5
	79,032	46	58.2
	79,885	32	40.1
95	318,030	152	47.8
	81,585	49	60.1
	83,919	38	45.3
	86,669	52	60.0
	89,262	41	45.9
	90,050	51	56.6
00	431,485	231	53.5
	89,719	48	53.5
	91,145	58	63.6
	94,135	55	58.4
	95,303	41	43.0
	95,438	45	47.2
05	465,740	247	53.0

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	94,697	48	50.7
1907	94,719	52	54.9
1908	95,852	60	62.6
1909	97,362	55	56.5
1910	97,552	61	62.5
1906-1910	480,182	276	57.5
1911	97,088	67	69.0
1912	98,288	62	63.1
1913	101,469	69	68.0

Source: Statistics of Tasmania. Official Statistics, Commonwealth of Australia, Commonwealth Demography, 1913.

Table 282
Mortality from Cancer in Tasmania Females, 1892-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1892	70,835	35	49.4
1893	71,037	39	54.9
1894	72,419	34	46.9
1895	73,816	43	58.3
1892-1895	288,107	151	52.4
1896	75,511	46	60.9
1897	77,710	43	55.3
1898	79,531	47	59.1
1899	81,138	50	61.6
1900	82,581	42	50.9
1896-1900	396,471	228	57.5
1901	82,806	47	56.8
1902	84,028	51	60.7
1903	86,240	45	52.2
1904	87,704	52	59.3
1905	89,040	52	58.4
1901-1905	429,818	247	57.5
1906	89,575	46	51.4
1907	90,072	60	66.6
1908	91,633	63	68.8
1909	92,865	69	74.3
1910	93,453	62	66.3
1906-1910	457,598	300	65.6
1911	93,228	52	55.8
1912	93,396	70	74.9
1913	94,517	75	79.4

Source: Statistics of Tasmania. Official Statistics, Commonwealth of Australia, Commonwealth Demography, 1913.

Table 283
Mortality from Cancer in Western Australia, 1881-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	29,859	6	20.1
1882	30,586	9	29.4
1883	31,551	10	31.7
1884	32,816	10	30.5
1885	34,753	17	48.9
1881-1885	159,565	52	32.6
1886	38,282	15	39.2
1887	42,212	17	40.3
1888	43,817	18	41.1
1889	44,737	20	44.7
1890	47,081	15	31.9
1886-1890	216,129	85	39.3
1891	50,840	20	39.3
1892	55,873	16	28.6
1893	61,746	19	30.8
1894	73,251	22	30.0
1895	91,047	25	27.5
1891-1895	332,757	102	30.7
1896	118,666	30	25.3
1897	148,656	51	34.3
1898	163,687	55	33.6
1899	168,568	60	35.6
1900	175,113	52	29.7
1896-1900	774,690	248	32.0
1901	188,135	83	44.1
1902	204,705	85	41.5
1903	219,643	92	41.9
1904	233,963	105	44.9
1905	246,681	127	51.5
1901-1905	1,093,127	492	45.0
1906	254,362	154	60.5
1907	255,510	131	51.3
1808	257,822	140	54.3
1909	263,279	182	69.1
1910	271,019	135	49.8
1906-1910	1,301,992	742	57.0
1911	286,807	177	61.7
1912	301,426	180	59.7
1913	314,178	178	56.7

Source: Statistical Register of Western Australia.

Table 284
Mortality from Cancer in Western Australia, Males, 1897-1913

	Population	Deaths from Cancer	Rate per 100,000 Population
7	102,327	37	36.2
8	107,624	39	36.2
9	107,204	41	38.2
0	108,452	33	30.4
900	425,607	150	35.2
1	115,080	53	46.1
2	124,839	46	36.8
3	132,272	44	33.3
4	139,338	61	43.8
5	145,471	74	50.9
905	657,000	278	42.3

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	148,501	91	61.3
1907	147,641	79	53.5
1908	147,918	77	52.1
1909	150,400	97	64.5
1910	154,467	74	47.9
1906-1910	748,927	418	55.8
1911	164,136	109	66.4
1912	172,098	106	61.6
1913	178,265	92	51.6

Source: Statistical Register of Western Australia.

Table 285
Mortality from Cancer in Western Australia, Females, 1897-1913

	Population	Deaths from Cancer	Rate per 100,000 Population
7	46,329	14	30.2
8	56,063	16	28.5
9	61,364	19	31.0
0	66,661	19	28.5
900	230,417	68	29.5
1	73,055	30	41.1
2	79,866	39	48.8
3	87,371	48	54.9
4	94,625	44	46.5
5	101,210	53	52.4
905	436,127	214	49.1

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	105,861	63	59.5
1907	107,869	52	48.2
1908	109,904	63	57.3
1909	112,879	85	75.3
1910	116,552	61	52.3
1906-1910	553,065	324	58.6
1911	122,671	68	55.4
1912	129,328	74	57.2
1913	135,913	86	63.3

Source: Statistical Register of Western Australia.

Table 286
rtality from Cancer, Northern Territory, Commonwealth of Australia 1911-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1911	3,319	1	30.1
1912	3,359	2	59.5
1913	3,360	2	54.6
1911-1913	10,038	5	49.8

Source: Official Statistics, Commonwealth of Australia, Commonwealth Demography, 1911-1913.

Table 287
Mortality from Cancer in New Zealand, 1881-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	493,482	134	27.2
1882	509,309	147	28.9
1883	529,292	158	29.9
1884	552,590	191	34.6
1885	573,362	177	30.9
1881-1885	2,658,035	807	30.4
1886	582,117	214	36.8
1887	596,374	238	39.9
1888	605,371	263	43.4
1889	611,716	260	42.5
1890	620,780	295	47.5
1886-1890	3,016,358	1,270	42.1
1891	629,783	295	46.8
1892	642,245	307	47.8
1893	661,349	332	50.2
1894	679,196	408	60.1
1895	692,417	383	55.3
1891-1895	3,304,990	1,725	52.2
1896	706,846	389	55.0
1897	721,609	395	54.7
1898	736,260	471	64.0
1899	749,984	468	62.4
1900	763,594	430	56.3
1896-1900	3,678,293	2,153	58.5
1901	777,968	515	66.2
1902	797,793	536	67.2
1903	820,217	582	71.0
1904	845,022	571	67.6
1905	870,000	566	65.1
1901-1905	4,111,000	2,770	67.4
1906	895,594	623	69.6
1907	919,105	674	73.3
1908	945,063	657	69.5
1909	971,784	711	73.2
1910	992,802	742	74.7
1906-1910	4,724,348	3,407	72.1
1911	1,014,896	809	79.7
1912	1,039,017	812	78.2
1913	1,068,644	854	79.9

Source: Statistics of the Colony of New Zealand.

Table 288
Mortality from Cancer in New Zealand, Males, 1889-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1889	325,249	144	44.3
1890	330,069	156	47.3
1891	334,366	154	46.1
1892	340,660	173	50.8
1893	351,391	188	53.5
1894	360,699	240	66.5
1895	366,744	208	56.7
1891-1895	1,753,860	963	54.9
1896	373,238	205	54.9
1897	380,845	210	55.1
1898	388,414	263	67.7
1899	395,402	271	68.5
1900	402,118	246	61.2
1896-1900	1,940,017	1,195	61.6
1901	408,926	265	64.8
1902	420,065	296	70.5
1903	432,791	325	75.1
1904	446,833	323	72.3
1905	460,679	313	67.9
1901-1905	2,169,294	1,522	70.2
1906	474,509	337	71.0
1907	487,150	361	74.1
1908	501,489	363	72.4
1909	515,368	383	74.3
1910	525,167	399	76.0
1906-1910	2,503,683	1,843	73.6
1911	534,863	448	83.8
1912	546,873	418	76.4
1913	561,160	446	79.5

Source: Statistics of the Colony of New Zealand.

APPENDIX G

Table 289
Mortality from Cancer in New Zealand, Females
1889-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
	286,467	116	40.5
	290,711	139	47.8
	295,417	141	47.7
	301,585	134	44.4
	309,958	144	46.5
	318,497	168	52.7
	325,673	175	53.7
395	1,551,130	762	49.1
	333,608	184	55.2
	340,764	185	54.3
	347,846	208	59.8
	354,582	197	55.6
	361,476	184	50.9
900	1,738,276	958	55.1
	369,042	250	67.7
	377,728	240	63.5
	387,426	257	66.3
	398,189	248	62.3
	409,321	253	61.8
905	1,941,706	1,248	64.3
1906	421,085	286	67.9
1907	431,955	313	72.5
1908	443,574	294	66.3
1909	456,416	328	71.9
1910	467,635	343	73.3
1906-1910	2,220,665	1,564	70.4
1911	480,033	361	75.2
1912	492,144	394	80.1
1913	507,484	408	80.4

Source: Statistics of the Colony of New Zealand.

Table 290
Cases of Cancer in the Colonial Hospital, Fiji
1898-1911

Year	Total Admissions	Cases of Cancer	Rate per 1,000 Admissions
	1,147	2	1.7
	1,407	5	3.6
	1,427	8	5.6
900	3,981	15	3.8
	1,222	2	1.6
	1,272	4	3.1
	1,773	13	7.3
	1,485	19	12.8
	1,398	8	5.7
905	7,150	46	6.4
1906	1,356	8	5.9
1907	1,731	4	2.3
1908	1,627	9	5.5
1909	1,810	8	4.4
1911	2,120	7	3.3
1906-1911*	8,644	36	4.2

Source: Fiji, Annual Medical Reports.

*Data for 1910 unobtainable.

APPENDIX G

Table 291

Cases of Cancer in the Colonial Hospital, Fiji, by Organs and Parts 1905-1911*

Carcinoma of	Cases	Per Cent.
Œsophagus	1	2.3
Stomach	3	6.8
Pylorus	5	11.4
Pancreas	1	2.3
Liver	8	18.2
Gall-bladder	2	4.5
Intestines	1	2.3
Rectum	2	4.5
Prostate	1	2.3
Breast	1	2.3
Uterus	8	18.2
Other or not specified	2	4.5
Epithelioma	4	9.0
Sarcoma	5	11.4
All organs	44	100.0

Source: Fiji, Annual Medical Reports.

*Data for 1910 unobtainable.

Table 292

Cases of Cancer in the Colonial Hospital, Fiji, by Race 1906-1911*

	Total Admissions	Cases of Cancer	Rate per 1,000 Admissions
Europeans	845	8	9.5
Fijians	2,991	4	1.3
Polynesians	825	1	1.2
East Indians	3,838	20	5.2
Miscellaneous	313	3	9.6
Total	8,812	36	4.1

Source: Fiji, Annual Medical Reports.

Note: The number of admissions given above includes 168 admissions from previous years.

*Data for 1910 unobtainable.

APPENDIX G

Table 293
Mortality from Cancer in Hawaii
1902-1913

r	Population	Deaths from Cancer	Rate per 100,000 Population
2	161,581	22	13.6
3	165,372	38	23.0
4	169,163	41	24.2
5	172,954	44	25.4
1905	669,070	145	21.7

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	176,745	44	24.9
1907	180,536	47	26.0
1908	184,327	58	31.5
1909	188,118	69	36.7
1910	193,014	95	49.2
1906-1910	922,740	313	33.9
1911	196,805	99	50.3
1912	200,596	71	35.4
1913	217,744	100	45.9

Source: Report of the President of the Board of Health of the Territory of Hawaii.

Table 294
Mortality from Cancer in the Territory of Hawaii, by Race
July 1, 1911, to June 30, 1913

ace	Population	Deaths from Cancer	Rate per 100,000 Population
iian	54,386	51	93.8
Iawaiian	26,131	7	26.8
guese	46,571	27	58.0
se	45,268	12	26.5
ese	166,404	33	19.8
hers	62,020	23	37.1
'otal	400,780	153	38.2

urce: Annual Reports of the Registrar-General of Hawaii.

Table 295
Proportionate Mortality from Cancer in the Territory of Hawaii according to Race, by Organs and Parts
July 1, 1911, to June 30, 1913

	Hawaiians		Portuguese		Chinese		Japanese	
n or Part	Deaths	Per Cent.	Deaths	Per Cent.	Deaths	Per Cent.	Deaths	Per Cent.
t	7	13.7	1	3.7	..	0.0	..	0.0
	..	0.0	..	0.0	1	8.3	..	0.0
ines	1	2.0	..	0.0	..	0.0	4	12.1
	5	9.8	4	14.8	1	8.3	1	3.0
ıch	14	27.5	11	40.8	6	50.0	19	57.6
s	15	29.4	2	7.4	2	16.7	6	18.2
organs	9	17.6	9	33.3	2	16.7	3	9.1
gans	51	100.0	27	100.0	12	100.0	33	100.0

urce: Annual Reports of the Registrar-General of Hawaii.

APPENDIX G

Table 296
Mortality from Cancer in Countries of America

	Population	Deaths from Cancer	Rate per 100,000 Population
Argentina	17,807,056	11,392	64.0
Bermuda	92,780	52	56.0
Bolivia	316,090	69	21.8
Brazil	9,384,279	3,145	33.5
British Guiana	1,487,922	271	18.2
British Honduras	197,820	29	14.7
British West Indies	6,897,104	1,439	20.9
Canada	19,689,825	12,208	62.0
Chile	17,047,786	6,077	35.6
Colombia	242,986	218	89.7
Costa Rica	1,849,534	751	40.6
Cuba	10,892,077	4,855	44.6
Danish West Indies	53,393	63	118.0
Dutch Guiana	174,775	167	95.6
Ecuador	200,000	122	61.0
Mexico	2,355,330	1,165	49.5
Newfoundland	1,192,843	616	51.6
Nicaragua	2,180,000	231	10.6
Peru	170,000	202	118.8
Salvador	357,240	208	58.2
United States	271,207,437	202,621	74.7
Uruguay	5,421,854	3,577	66.0
Venezuela	13,331,180	1,960	14.7
Total	382,549,311	251,438	65.7

Population, 1911: 82,835,662.

Note: Argentina.....Province of Buenos Aires, 1908-1912, City of Buenos Aires, 1907, 1911, City of Rosario de Santa Fe, 1907-1911, Province of Tucumán, 1906-1910, City of Santiago del Estero, 1904-1908

Bermuda...........1906-1910

Bolivia.............City of La Paz, 1901-1905

Brazil..............Federal District of Rio de Janeiro, 1906-1910, State of Paraná, 1906-1910, City of Bahia, 1907-1911, City of Sao Paulo, 1908-1912, City of Pelotas, 1906-1907, 1909-1911, City of Bello Horizonte, 1910-1912

British Guiana......1908-1912

British Honduras....1906-1910

British West Indies..Jamaica, 1908-1912, Trinidad, 1907-1911, British Windward and Leeward Islands, 1907-1911

Canada.............Province of Ontario, 1908-1912, Province of Nova Scotia, 1910-1913, Province of Prince Edward Island, 1913, Province of British Columbia, 1909-1913, City of Montreal, 1908-1912, City of Quebec, 1908-1912, City of Winnipeg, 1910-1912, City of St. John, N. B., 1908-1912

Chile...............1908-1912

Colombia...........City of Bogotá, 1912-1913

Costa Rica..........1908-1912

Cuba...............1908-1912

Danish West Indies..Island of St. Thomas, 1909-1913

Dutch Guiana.......City of Paramaribo, 1908-1912

Ecuador............City of Guayaquil, 1910-1912

Mexico.............City of Mexico, 1908-1912

Newfoundland......1907-1911

Nicaragua..........1908-1911

Salvador............City of San Salvador, 1908-1913

Peru...............City of Lima, 1904, City of Trujillo, 1909-1913

United States........Registration Area, 1908-1912

Uruguay............1907-1911

Venezuela..........1906-1910

Table 297

ality from Cancer in the Province of Ontario, Canada

1881-1913

r	Population	Deaths from Cancer	Rate per 100,000 Population
1	1,923,228	313	16.3
2	1,942,337	397	20.4
3	1,961,446	403	20.5
4	1,980,555	422	21.3
5	1,999,664	463	23.2
885	9,807,230	1,998	20.4
6	2,018,773	440	21.8
7	2,037,882	614	30.1
8	2,056,991	635	30.9
9	2,076,100	714	34.4
0	2,095,209	685	32.7
890	10,284,955	3,088	30.0
1	2,114,321	579	27.4
2	2,121,183	676	31.9
3	2,128,045	678	31.9
4	2,134,907	621	29.1
5	2,141,769	620	28.9
895	10,640,225	3,174	29.8
6	2,148,632	731	34.0
7	2,155,495	927	43.0
8	2,162,358	975	45.1
9	2,169,221	1,041	48.0
0	2,176,084	1,055	48.5
900	10,811,790	4,729	43.7
1	2,182,947	1,094	50.1
2	2,216,979	1,048	47.3
3	2,251,011	1,156	51.4
4	2,285,043	1,253	54.8
5	2,319,076	1,224	52.8
905	11,255,056	5,775	51.3
6	2,353,109	1,411	60.0
7	2,387,142	1,329	55.7
8	2,421,175	1,348	55.7
9	2,455,208	1,597	65.0
0	2,489,241	1,587	63.8
910	12,105,875	7,272	60.1
1	2,523,274	1,602	63.5
2	2,560,000	1,778	69.5
3	2,600,960	1,806	69.4

ce: Reports Relating to the Regis-
ı of Births, Marriages and Deaths
Province of Ontario, 1881-1913.

Table 298

Mortality from Cancer in Toronto Province of Ontario

1881-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	86,415	23	26.6
1882	92,175	25	27.1
1883	97,935	24	24.5
1884	103,696	37	35.7
1885	109,457	49	44.8
1881-1885	489,678	158	32.3
1886	115,218	55	47.7
1887	120,979	59	48.8
1888	126,740	76	60.0
1889	132,501	93	70.2
1890	138,262	78	56.4
1886-1890	633,700	361	57.0
1891	144,023	74	51.4
1892	150,424	87	57.8
1893	156,825	106	67.6
1894	163,226	85	52.1
1895	169,628	112	66.0
1891-1895	784,126	464	59.2
1896	176,030	116	65.9
1897	182,432	114	62.5
1898	188,834	129	68.3
1899	195,236	134	68.6
1900	201,638	171	84.8
1896-1900	944,170	664	70.3
1901	208,040	163	78.4
1902	224,889	133	59.1
1903	241,738	157	64.9
1904	258,588	187	72.3
1905	275,438	191	69.3
1901-1905	1,208,693	831	68.8
1906	292,288	187	64.0
1907	309,138	204	66.0
1908	325,988	203	62.3
1909	342,838	259	75.5
1910	359,688	270	75.1
1906-1910	1,629,940	1,123	68.9
1911	376,538	255	67.7
1912	393,388	326	82.9
1913	410,238	336	81.9

Source: Reports Relating to the Registration of Births, Marriages and Deaths in the Province of Ontario, 1881-1913.

Table 299
Mortality from Cancer in Toronto Males, 1881-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	41,917	8	19.1
1882	44,696	14	31.3
1883	47,469	15	31.6
1884	50,241	14	27.9
1885	53,010	22	41.5
1881-1885	237,333	73	30.8
1886	55,777	22	39.4
1887	58,542	25	42.7
1888	61,291	35	57.1
1889	64,038	34	53.1
1890	66,781	29	43.4
1886-1890	306,429	145	47.3
1891	69,520	33	47.5
1892	72,384	28	38.7
1893	75,213	45	59.8
1894	78,022	26	33.3
1895	80,811	49	60.6
1891-1895	375,950	181	48.1
1896	83,579	55	65.8
1897	86,327	44	51.0
1898	89,054	62	69.6
1899	91,761	53	57.8
1900	94,447	65	68.8
1896-1900	445,168	279	62.7
1901	97,113	60	61.8
1902	105,585	52	49.2
1903	114,149	68	59.6
1904	122,803	71	57.8
1905	131,549	84	63.9
1901-1905	571,199	335	58.6
1906	140,386	76	54.1
1907	149,314	80	53.6
1908	158,332	78	49.3
1909	167,442	123	73.5
1910	176,643	119	67.4
1906-1910	792,117	476	60.1
1911	185,934	99	53.2
1912	194,257	130	66.9
1913	202,575	129	63.7

Source: Reports Relating to the Registration of Births, Marriages and Deaths in the Province of Ontario, 1881-1913.

Table 300
Mortality from Cancer in Toronto Females, 1881-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	44,498	15	33.7
1882	47,479	11	23.2
1883	50,466	9	17.8
1884	53,455	23	43.0
1885	56,447	27	47.8
1881-1885	252,345	85	33.7
1886	59,441	33	55.5
1887	62,437	34	54.5
1888	65,449	41	62.6
1889	68,463	59	86.2
1890	71,481	49	68.5
1886-1890	327,271	216	66.0
1891	74,503	41	55.0
1892	78,040	59	75.6
1893	81,612	61	74.7
1894	85,204	59	69.2
1895	88,817	63	70.9
1891-1895	408,176	283	69.3
1896	92,451	61	66.0
1897	96,105	70	72.8
1898	99,780	67	67.1
1899	103,475	81	78.3
1900	107,191	106	98.9
1896-1900	499,002	385	77.2
1901	110,927	103	92.9
1902	119,304	81	67.9
1903	127,589	89	69.8
1904	135,785	116	85.4
1905	143,889	107	74.4
1901-1905	637,494	496	77.8
1906	151,902	111	73.1
1907	159,824	124	77.6
1908	167,656	125	74.6
1909	175,396	136	77.5
1910	183,045	151	82.5
1906-1910	837,823	647	77.2
1911	190,604	156	81.8
1912	199,131	196	98.4
1913	207,663	207	99.7

Source: Reports Relating to the Registration of Births, Marriages and Deaths in the Province of Ontario, 1881-1913.

APPENDIX G

Table 301
Mortality from Cancer in the City of Montreal
1881-1913

	Population	Deaths from Cancer	Rate per 100,000 Population
1	115,238	46	39.9
2	125,675	65	51.7
3	136,112	63	46.3
4	146,550	59	40.3
5	156,988	79	50.3
885	680,563	312	45.8
6	167,426	85	50.8
7	177,864	75	42.2
8	188,302	87	46.2
9	198,740	97	48.8
0	209,178	74	35.4
890	941,510	418	44.4
1	219,616	99	45.1
2	224,427	109	48.6
3	229,238	100	43.6
4	234,049	114	48.7
5	238,860	117	49.0
895	1,146,190	539	47.0
6	243,672	133	54.6
7	..	..	..
8	253,296	182	71.9
9	258,108	190	73.6
0	262,920	146	55.5
900	1,017,996	651	63.9
1	267,730	196	73.2
2	288,005	158	54.9
3	308,280	206	66.8
4	328,555	180	54.8
5	348,830	167	47.9
905	1,541,400	907	58.8

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	369,105	213	57.7
1907	389,380	234	60.1
1908	409,655	230	56.1
1909	429,930	267	62.1
1910	450,205	292	64.9
1906-1910	2,048,275	1,236	60.3
1911	470,480	309	65.7
1912	488,400	331	67.8
1913	515,700	283	54.9

Source: 1881-1890, Statistique Demographique des Grandes Villes du Monde, No. 40. Amsterdam, 1912.

Reports on the Sanitary State of the City of Montreal, 1891-1913.

APPENDIX G

Table 302
Mortality from Cancer in the City of Quebec
1894-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1894	64,815	28	43.2
1895	65,390	16	24.5
1896	65,965	20	30.3
1897	66,540	23	34.6
1898	67,115	32	47.7
1899	67,690	27	39.9
1900	68,265	34	49.8
1896-1900	335,575	136	40 5
1901	68,840	38	55.2
1902	69,595	44	63.2
1903	70,204	38	54.1
1904	70,819	31	43.8
1905	71,439	30	42.0
1901-1905	350,897	181	51.6
1906	72,034	25	34.7
1907	74,390	39	52.4
1908	73,333	33	45.0
1909	76,000	42	55.3
1910	77,100	44	57.1
1906-1910	372,857	183	49.1
1911	78,190	51	65.2
1912	79,280	45	56.8

Source: Annual Reports of the Board of Health of the Province of Quebec.

Table 303
Mortality from Cancer in the City of Winnipeg, by Sex
1910-1913

TOTAL

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1910	127,555	64	50.2
1911	142,339	71	49.9
1912	159,256	82	51.5
1913	177,433	95	53.5
1910-1913	606,583	312	51.4

MALES

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1910	69,773	36	51.6
1911	77,859	31	39.8
1912	87,113	39	44.8
1913	97,056	46	47.4
1910-1913	331,801	152	45.8

FEMALES

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1910	57,782	28	48.5
1911	64,480	40	62.0
1912	72,143	43	59.6
1913	80,377	49	61.0
1910-1913	274,782	160	58.2

Source: City of Winnipeg, Report of the Department of Public Health, 1910-1913.

Table 304
Mortality from Cancer in British Columbia, 1901-1913

	Population	Deaths from Cancer	Rate per 100,000 Population
	175,657	49	27.9
	197,340	81	41.0
	219,023	73	33.3
	240,706	66	27.4
	262,388	63	24.0
05	1,095,114	332	30.3

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	284,070	71	25.0
1907	305,752	101	33.0
1908	327,434	99	30.2
1909	349,116	123	35.2
1910	370,798	152	41.0
1906-1910	1,637,170	546	33.4
1911	392,480	148	37.7
1912	414,162	180	43.5
1913	435,844	159	36.5

Source: Annual Reports of the Registrar of Births, Deaths and Marriages for the Province of British Columbia.

Table 305
lity from Cancer in the Prov-ıce of Nova Scotia, by Sex
1910-1913

	Population	Deaths from Cancer	Rate per 100,000 Population
	TOTAL		
	486,870	349	71.7
	492,338	371	75.4
	496,423	378	76.1
	501,751	348	69.4
13	1,977,382	1,446	73.1
	MALES		
	248,304	170	68.5
	251,019	179	71.3
	253,176	171	67.5
	255,893	159	62.1
13	1,008,392	679	67.3
	FEMALES		
	238,566	179	75.0
	241,319	192	79.6
	243,247	207	85.1
	245,858	189	76.9
13	968,990	767	79.2

e: Reports of the Deputy Regis-neral Relating to the Registration ıs, Marriages and Deaths in Nova 1910-1913.

Table 306
Mortality from Cancer in the Province of Prince Edward Island
1913-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1913	92,000	54	58.7
1914	90,631	46	50.8
1913-1914	182,631	100	54.7

Source: Report of the Registrar-General of Births, Marriages and Deaths of the Province of Prince Edward Island.

APPENDIX G

Table 307
Mortality from Cancer in the City of St. John, Province of New Brunswick
1891-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	39,179	9	23.0
1892	39,332	18	45.8
1893	39,485	15	38.0
1894	39,638	26	65.6
1895	39,791	32	80.4
1891-1895	197,425	100	50.7
1896	39,944	32	80.1
1897	40,097	29	72.3
1898	40,250	35	87.0
1899	40,403	24	59.4
1900	40,556	38	93.7
1896-1900	201,250	158	78.5
1901	40,711	44	108.1
1902	40,891	37	90.5
1903	41,071	37	90.1
1904	41,251	39	94.5
1905	41,431	43	103.8
1901-1905	205,355	200	97.4
1906	41,611	37	88.9
1907	41,791	34	81.4
1908	41,971	29	69.1
1909	42,151	32	75.9
1910	42,331	36	85.0
1906-1910	209,855	168	80.1
1911	42,511	36	84.7
1912	42,691	40	93.7
1913	42,871	38	88.6

Source: Annual Reports of the Provincial Board of Health of New Brunswick.

Table 308
Mortality from Cancer in the Colony of Newfoundland and Labrador
1906-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	231,974	116	50.0
1907	234,172	110	47.0
1908	236,370	132	55.8
1909	238,568	123	51.6
1910	240,767	114	47.3
1906-1910	1,181,851	595	50.3
1911	242,966	137	56.4
1912	243,928	118	48.4
1913	246,397	111	45.0

Source: Annual Reports of the Registrar-General of Births, Marriages and Deaths of Newfoundland for 1906-1913.

Table 309
Mortality from Cancer in the Bermuda Islands, 1891-1913

	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
	15,013	6	40.0	1906	18,264	11	60.2
	15,265	14	91.7	1907	18,410	8	43.5
	15,517	8	51.6	1908	18,556	10	53.9
	15,769	10	63.4	1909	18,702	16	85.6
	16,021	5	31.2	1910	18,848	7	37.1
5	77,585	43	55.4	1906-1910	92,780	52	56.0
	16,273	9	55.3	1911	18,994	6	31.6
	16,525	4	24.2	1912	19,392	12	61.9
	16,777	13	77.5	1913	19,790	13	65.7
	17,029	12	70.5				
	17,281	13	75.2				
0	83,885	51	60.8				
	17,535	9	51.3				
	17,680	9	50.9				
	17,826	11	61.7				
	17,972	15	83.5				
	18,118	12	66.2				
5	89,131	56	62.8				

Source: Bermuda, Reports of the Registrar-General, 1891-1913.

Table 310
ortality from Cancer in the Bermuda Islands, Males, 1891-1913

	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
	7,036	2	28.4	1906	8,840	4	45.2
	7,193	3	41.7	1907	8,886	4	45.0
	7,350	3	40.8	1908	8,932	3	33.6
	7,507	3	40.0	1909	8,978	7	78.0
	7,664	1	13.0	1910	9,024	3	33.2
5	36,750	12	32.7	1906-1910	44,660	21	47.0
	7,821	3	38.4	1911	9,070	4	44.1
	7,978	1	12.5	1912	9,283	6	64.6
	8,135	4	49.2	1913	9,497	6	63.2
	8,292	4	48.2				
	8,449	3	35.5				
0	40,675	15	36.9				
	8,606	3	34.9				
	8,656	4	46.2				
	8,702	3	34.5				
	8,748	7	80.0				
	8,794	5	56.9				
5	43,506	22	50.6				

Source: Bermuda, Reports of the Registrar-General, 1891-1913.

Table 311

Mortality from Cancer in the Bermuda Islands, Females 1891-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	7,977	4	50.1
1892	8,072	11	136.3
1893	8,167	5	61.2
1894	8,262	7	84.7
1895	8,357	4	47.9
1891-1895	40,835	31	75.9
1896	8,452	6	71.0
1897	8,547	3	35.1
1898	8,642	9	104.1
1899	8,737	8	91.6
1900	8,832	10	113.2
1896-1900	43,210	36	83.3
1901	8,929	6	67.2
1902	9,024	5	55.4
1903	9,124	8	87.7
1904	9,224	8	86.7
1905	9,324	7	75.1
1901-1905	45,625	34	74.5
1906	9,424	7	74.3
1907	9,524	4	42.0
1908	9,624	7	72.7
1909	9,724	9	92.6
1910	9,824	4	40.7
1906-1910	48,120	31	64.4
1911	9,924	2	20.2
1912	10,109	6	59.4
1913	10,293	7	68.0

Source: Bermuda, Reports of the Registrar-General, 1891-1913.

Table 312

Mortality from Cancer in Jamaica 1881-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	580,804	57	9.8
1882	588,718	43	7.3
1883	594,023	65	10.9
1884	591,819	66	11.2
1885	596,383	64	10.7
1881-1885	2,951,747	295	10.0
1886	603,354	65	10.8
1887	603,500	61	10.1
1888	613,376	73	11.9
1889	624,105	70	11.2
1890	634,930	80	12.6
1886-1890	3,079,265	349	11.3
1891	636,559	91	14.3
1892	643,407	88	13.7
1893	651,615	96	14.7
1894	661,046	102	15.4
1895	670,383	115	17.2
1891-1895	3,263,010	492	15.1
1896	679,198	113	16.6
1897	688,534	97	14.1
1898	698,133	109	15.6
1899	708,106	129	18.2
1900	718,783	124	17.3
1896-1900	3,492,754	572	16.4
1901	729,093	118	16.2
1902	739,970	109	14.7
1903	752,630	125	16.6
1904	764,081	128	16.8
1905	773,517	153	19.8
1901-1905	3,759,291	633	16.8
1906	781,779	141	18.0
1907	791,373	126	15.9
1908	796,862	136	17.1
1909	803,867	149	18.5
1910	814,987	169	20.1
1906-1910	3,988,868	721	18.1
1911	826,078	142	17.2
1912	838,575	153	18.2
1913	851,072	157	18.4

Source: Jamaica, Annual Reports of the Registrar-General.

Table 313
tality from Cancer in Jamaica
Males, 1881-1913

	Population	Deaths from Cancer	Rate per 100,000 Population
1	277,857	21	7.6
2	281,643	17	6.0
3	284,181	21	7.4
4	283,126	28	9.9
5	285,310	21	7.4
885	1,412,117	108	7.6
6	288,645	24	8.3
7	288,714	17	5.9
8	293,439	26	8.9
9	298,572	22	7.4
0	..	..	..
889	1,169,370	89	7.6
1	304,530	26	8.5
2	307,806	27	8.8
3	311,733	33	10.6
4	316,244	32	10.1
5	320,711	40	12.5
895	1,561,024	158	10.1
6	324,928	42	12.9
7	329,395	37	11.2
8	333,987	45	13.5
9	338,758	33	9.7
0	343,866	50	14.5
900	1,670,934	207	12.4
1	348,798	31	8.9
2	354,002	35	9.9
3	359,983	37	10.3
4	365,460	46	12.6
5	369,896	47	12.7
905	1,798,139	196	10.9
6	373,847	48	12.8
7	378,435	40	10.6
8	380,980	39	10.2
9	384,329	45	11.7
0	389,645	55	14.1
910	1,907,236	227	11.9
1	394,865	56	14.2
2	400,839	55	13.7
3	406,813	58	14.3

ce: Jamaica, Annual Reports of the ·ar-General.

Table 314
Mortality from Cancer in Jamaica
Females 1881-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1881	302,947	36	11.9
1882	307,075	26	8.5
1883	309,842	44	14.2
1884	308,693	38	12.3
1885	311,073	43	13.8
1881-1885	1,539,630	187	12.1
1886	314,709	41	13.0
1887	314,786	44	14.0
1888	319,937	47	14.7
1889	325,533	48	14.7
1890	..	..	..
1886-1889	1,274,965	180	14.1
1891	332,029	65	19.6
1892	335,601	61	18.2
1893	339,882	63	18.5
1894	344,802	70	20.3
1895	349,672	75	21.4
1891-1895	1,701,986	334	19.6
1896	354,270	71	20.0
1897	359,139	60	16.7
1898	364,146	64	17.6
1899	369,348	96	26.0
1900	374,917	74	19.7
1896-1900	1,821,820	365	20.0
1901	380,295	87	22.9
1902	385,968	74	19.2
1903	392,647	88	22.4
1904	398,621	82	20.6
1905	403,621	106	26.3
1901-1905	1,961,152	437	22.3
1906	407,932	93	22.8
1907	412,938	86	20.8
1908	415,882	97	23.3
1909	419,538	104	24.8
1910	425,342	114	26.8
1906-1910	2,081,632	494	23.7
1911	431,213	86	19.9
1912	437,736	98	22.4
1913	444,259	99	22.3

Source: Jamaica, Annual Reports of the Registrar-General.

Table 315

Mortality from Cancer in the Windward and Leeward Islands British West Indies

1901-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	110,214	26	23.6
1902	110,350	25	22.7
1903	110,448	23	20.8
1904	200,420	49	24.4
1905	237,254	83	35.0
1901-1905	768,686	206	26.8
1906	237,896	70	29.4
1907	238,344	57	23.9
1908	238,865	64	26.8
1909	239,239	61	25.5
1910	239,930	54	22.5
1906-1910	1,194,274	306	25.6
1911	240,586	64	26.6
1912	237,041	80	33.7

Source: The Registrar-General's Reports of the several above-mentioned islands.

Note: Includes St. Kitts-Nevis, 1901-1912, Grenada, 1901-1912, St. Lucia, 1904-1912, St. Vincent, 1904-1912, Antigua and Barbuda, 1905-1912.

Table 316

Mortality from Cancer in Trinidad

1890-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1890	196,510	25	12.7
1891	201,200	7	3.5
1892	206,220	25	12.1
1893	211,301	30	14.2
1894	216,508	38	17.6
1895	221,842	20	9.0
1891-1895	1,057,071	120	11.4
1896	227,309	23	10.1
1897	232,909	23	9.9
1898	238,648	18	7.5
1899	264,630*	33	12.5
1900	269,893	42	15.6
1896-1900	1,233,389	139	11.3
1901	275,261	32	11.6
1902	282,125	47	16.7
1903	287,737	47	16.3
1904	293,460	38	12.9
1905	299,296	79	26.4
1901-1905	1,437,879	243	16.9
1906	305,249	68	22.3
1907	311,321	81	26.0
1908	317,513	50	15.7
1909	323,828	61	18.8
1910	330,270	71	21.5
1906-1910	1,588,181	331	20.8
1911	336,839	88	26.1
1912	343,408	101	29.4
1913	348,958	120	34.4

Source: Annual Reports of the Registrar-General on the Vital Statistics, Trinidad.

*Tobago is not included previously to 1899.

APPENDIX G

Table 317
Mortality from Cancer in the Hospitals of Barbados
1899-1903

Year	Deaths from All Causes	Deaths from Cancer	Cancer Per Cent.
1899	860	24	2.8
1900	782	27	3.5
1901	985	29	2.9
1902	857	19	2.2
1903	712	21	2.9
1899-1903	4,196	120	2.9

Source: Correspondence relating to the Cancer Research Scheme, London, 1906.

Table 318
Mortality from Cancer in St. Thomas Danish West Indies
1901-1914

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	11,012	6	54.5
1902	10,978	6	54.7
1903	10,944	6	54.8
1904	10,910	18	165.0
1905	10,876	7	64.4
1901-1905	54,720	43	78.6
1906	10,843	1	9.2
1907	10,810	12	111.0
1908	10,777	4	37.1
1909	10,744	13	121.0
1910	10,711	9	84.0
1906-1910	53,885	39	72.4
1911	10,678	15	140.5
1912	10,646	9	84.5
1913	10,614	17	160.2
1914	10,572	5	47.3

Source: Sanitary Reports for St. Thomas, D. W. I.

Table 319
Mortality from Cancer in British Honduras, 1894-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1894	33,272	3	9.0
1895	33,873	3	8.9
1896	34,474	6	17.4
1897	35,075	1	2.9
1898	35,676	6	16.8
1899	36,277	4	11.0
1900	36,878	7	19.0
1896-1900	178,380	24	13.5
1901	37,479	10	26.7
1902	37,776	8	21.2
1903	38,074	3	7.9
1904	38,372	8	20.8
1905	38,670	7	18.1
1901-1905	190,371	36	18.9
1906	38,968	6	15.4
1907	39,266	7	17.8
1908	39,564	8	20.2
1909	39,862	4	10.0
1910	40,160	4	10.0
1906-1910	197,820	29	14.7
1911	40,458	8	19.8
1912	40,814	11	27.0
1913	41,170	5	12.1

Source: Letter from the Acting Registrar-General of British Honduras.

APPENDIX G

Table 320
Mortality from Cancer in British Guiana
1896-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1896	287,528	60	20.9	1906	299,573	72	24.0
1897	289,368	57	19.7	1907	299,791	55	18.3
1898	291,208	48	16.5	1908	297,997	75	25.2
1899	293,048	49	16.7	1909	297,905	49	16.4
1900	294,888	70	23.7	1910	297,097	38	12.8
1896-1900	1,456,040	284	19.5	1906-1910	1,492,363	289	19.4
1901	296,728	78	26.3	1911	295,879	49	16.6
1902	297,306	54	18.2	1912	299,044	60	20.1
1903	297,884	75	25.2	1913	301,596	88	29.2
1904	297,398	59	19.8				
1905	297,416	59	19.8				
1901-1905	1,486,732	325	21.9				

Source: British Guiana, Report of the Registrar-General.

Table 321
Mortality from Cancer in British Guiana, Males
1896-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1896	153,080	21	13.7	1906	157,554	31	19.7
1897	154,060	30	19.5	1907	157,158	14	8.9
1898	155,039	20	12.9	1908	155,746	33	21.2
1899	156,019	18	11.5	1909	155,380	19	12.2
1900	156,998	20	12.7	1910	154,616	21	13.6
1896-1900	775,196	109	14.1	1906-1910	780,454	118	15.1
1901	157,978	26	16.5	1911	153,602	21	13.7
1902	158,273	21	13.3	1912	155,154	32	20.6
1903	158,041	38	24.0	1913	156,568	31	19.8
1904	157,288	18	11.4				
1905	156,846	13	8.3				
1901-1905	788,426	116	14.7				

Source: British Guiana, Report of the Registrar-General.

APPENDIX G

Table 322
Mortality from Cancer in British Guiana, Females
1896-1913

	Population	Deaths from Cancer	Rate per 100,000 Population
	134,448	39	29.0
	135,308	27	20.0
	136,169	28	20.6
	137,029	31	22.6
	137,890	50	36.3
00	680,844	175	25.7
	138,750	52	37.5
	139,033	33	23.7
	139,843	37	26.5
	140,110	41	29.3
	140,570	46	32.7
05	698,306	209	29.9

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	142,019	41	28.9
1907	142,633	41	28.7
1908	142,251	42	29.5
1909	142,525	30	21.0
1910	142,481	17	11.9
1906-1910	711,909	171	24.0
1911	142,277	28	19.7
1912	143,890	28	19.5
1913	145,033	57	39.3

Source: British Guiana, Report of the Registrar-General.

Table 323
Mortality from Cancer in the City of Paramaribo, Dutch Guiana
1903-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1903	33,100	28	84.6
1904	33,535	31	92.4
1905	34,085	30	88.0
1906	34,870	27	77.4
1907	34,962	36	103.0
1908	34,795	54	155.2
1909	35,082	34	96.9
1910	35,000	32	91.4
1906-1910	174,709	183	104.7
1911	34,898	28	80.2
1912	35,000	19	54.3

Source: Original data furnished by the Secretary to the Governor of Suriname.

APPENDIX G

Table 324
Mortality from Cancer in the City of Paramaribo, Dutch Guiana, by Sex
1903-1912

MALES				FEMALES			
Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1903	15,100	9	59.6	1903	18,000	19	105.6
1904	15,392	7	45.5	1904	18,143	24	132.3
1905	15,726	8	50.9	1905	18,359	22	119.8
1906	15,973	10	62.6	1906	18,897	17	90.0
1907	16,168.	17	105.1	1907	18,794	19	101.1
1908	16,162	24	148.5	1908	18,633	30	161.0
1909	16,176	11	68.0	1909	18,906	23	121.7
1910	16,200	10	61.7	1910	18,800	22	117.0
1906-1910	80,679	72	89.2	1906-1910	94,030	111	118.0
1911	16,259	12	73.8	1911	18,639	16	85.8
1912	16,300	7	42.9	1912	18,700	12	64.2

Source: Original data furnished by the Secretary to the Governor of Suriname.

Table 325
Mortality from Cancer in Cuba
1901-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	1,691,843	503	29.7
1902	1,751,366	539	30.8
1903	1,810,889	601	33.2
1904	1,870,412	661	35.3
1905	1,929,935	746	38.7
1901-1905	9,054,445	3,050	33.7
1906	1,989,458	808	40.6
1907	2,048,980	813	39.7
1908	2,082,691	901	43.3
1909	2,116,402	981	46.4
1910	2,150,112	991	46.1
1906-1910	10,387,643	4,494	43.3
1911	2,229,257	977	43.8
1912	2,313,615	1,005	43.4
1913	2,391,134	1,145	47.9

Source: Informe bi-anual Sanitario y Demografico de la Republica de Cuba, 1902-1905.
Sanidad y Beneficencia. Boletin oficial de la Secretaria, 1906-1912.

Table 326
Mortality from Cancer in Cuba, by Sex
1902-1913

	MALES			FEMALES			
	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
	912,585	245	26.8	1902	838,781	294	35.1
	945,045	293	31.0	1903	865,844	308	35.6
	977,505	310	31.7	1904	892,907	351	39.3
	1,009,965	358	35.4	1905	919,970	388	42.2
05	3,845,100	1,206	31.4	1902-1905	3,517,502	1,341	38.1
	1,042,425	360	34.5	1906	947,033	448	47.3
	1,074,882	393	36.6	1907	974,098	420	43.1
	1,093,880	453	41.4	1908	988,811	448	45.3
	1,112,878	501	45.0	1909	1,003,524	480	47.8
	1,131,876	516	45.6	1910	1,018,236	475	46.6
10	5,455,941	2,223	40.7	1906-1910	4,931,702	2,271	46.0
	1,175,041	500	42.6	1911	1,054,216	477	45.2
	1,221,126	516	42.3	1912	1,092,489	489	44.8
	1,262,041	605	47.9	1913	1,129,093	540	47.8

Source: Informe bi-anual Sanitario y Demografico de la Republica de Cuba, 1902-1905.

Sanidad y Beneficencia. Boletin oficial de la Secretaria, 1906-1913.

Table 327
lity from Cancer in Cuba, by Organs and Parts, according to Sex
1908-1912

Organ or Part	MALES		FEMALES	
	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer	Rate per 100,000 Population
cavity	455	7.9	138	2.7
h and liver	870	15.2	513	9.9
eum, intestines, rectum	143	2.5	160	3.1
generative organs	..	..	973	18.9
	7	0.1	232	4.5
	140	2.4	75	1.5
r not specified organs	871	15.2	278	5.4
ans	2,486	43.3	2,369	45.9

ce: Sanidad y Beneficencia. Boletin oficial de la Secretaria. Habana.

APPENDIX G

Table 328
Mortality from Cancer in Cuba, by Organs and Parts, according to Race 1908-1912

Organ or Part	WHITE Deaths from Cancer	WHITE Rate per 100,000 Population	COLORED Deaths from Cancer	COLORED Rate per 100,000 Population
Buccal cavity	485	6.4	108	3.4
Stomach and liver	1,014	13.5	369	11.5
Peritoneum, intestines, rectum	232	3.1	71	2.2
Breast	148	2.0	91	2.8
Female generative organs	626	8.3	347	10.8
Skin	171	2 3	44	1.4
Other or not specified organs	956	12.7	193	6.0
All organs	3,632	48.2	1,223	38.0

Source: Sanidad y Beneficencia. Boletin oficial de la Secretaria. Habana.

Table 329
Mortality from Cancer in Havana, Cuba 1899-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1899	242,055	142	58.7
1900	249,613	140	56.1
1901	257,172	171	66.5
1902	264,731	176	66.5
1903	272,290	213	78.2
1904	279,849	210	75.0
1905	287,408	232	80.7
1901-1905	1,361,450	1,002	73.6
1906	294,967	268	90.9
1907	302,526	269	88.9
1908	310,616	318	102.4
1909	318,706	344	107.9
1910	326,796	338	103.4
1906-1910	1,553,611	1,537	98.9
1911	334,886	340	101.5
1912	353,509	329	93.1

Source: Informe bi-anual Sanitario y Demografico de la Republica de Cuba, 1902-1905.
Sanidad y Beneficencia. Boletin oficial de la Secretaria, 1906-1912.

APPENDIX G

Table 330
Mortality from Cancer in Porto Rico
1910-1913

: ɛ)	Population	Deaths from Cancer	Rate per 100,000 Population
0	1,113,406	207	18.6
1	1,129,198	195	17.3
2	1,144,990	223	19.5
3	1,160,782	285	24.6
.913	4,548,376	910	20.0

ırce: Informe Anual del Director de Sanidad al Hon. Gobernador de Puerto Rico.

Table 331
Mortality from Cancer in Porto Rico, by Organs and Parts
July 1, 1910, to June 30, 1913

Organ or Part	Deaths from Cancer	Rate per 100,000 Population
l cavity	37	1.1
ch and liver	174	5.1
neum, intestines and rectum	56	1.6
ıtive organs	229	6.7
	20	0.6
	25	0.7
or not specified organs	162	4.7
;ans	703	20.5

ırce: Informe Anual del Director de Sanidad al Hon. Gobernador de Puerto Rico.

APPENDIX G

Table 332
Mortality from Cancer in the City of Mexico, by Sex
1905-1913

TOTAL

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1905	419,981	249	59.3
1906	430,198	251	58.3
1907	440,415	243	55.2
1908	450,632	252	55.9
1909	460,849	221	48.0
1910	471,066	229	48.6
1906-1910	2,253,160	1,196	53.1
1911	481,283	208	43.2
1912	491,500	255	51.9
1913	501,717	242	48.2

MALES

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1905	196,209	61	31.1
1906	200,722	61	30.4
1907	205,235	77	37.5
1908	209,748	77	36.7
1909	214,261	61	28.5
1910	218,774	51	23.3
1906-1910	1,048,740	327	31.2
1911	223,287	49	21.9
1912	227,800	61	26.8
1913	232,313	55	23.7

FEMALES

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1905	223,772	188	84.0
1906	229,476	190	82.8
1907	235,180	166	70.6
1908	240,884	175	72.6
1909	246,588	160	64.9
1910	252,292	178	70.6
1906-1910	1,204,420	869	72.2
1911	257,996	159	61.6
1912	263,700	194	73.6
1913	269,404	187	69.4

Source: Boletin del Consejo Superior de Salubridad. Publicacion Mensual. Mexico, 1905-1913.

APPENDIX G

Table 333

ortality from Cancer in the City of Mexico, by Organs and Parts according to Sex, 1908-1912

Organ or Part	MALES Deaths from Cancer	MALES Rate per 100,000 Population	FEMALES Deaths from Cancer	FEMALES Rate per 100,000 Population
cavity..................	30	2.7	17	1.3
h and liver.............	80	7.3	119	9.4
ɔum, intestines, rectum..	26	2.4	50	4.0
generative organs......	..	..	458	36.3
....	..	..	44	3.5
....	20	1.8	10	0.8
r not specified organs...	143	13.1	168	13.3
ıns	299	27.3	866	68.6

ɔe: Boletin del Consejo Superior de Salubridad. Publicacion Mensual. Mex-
8-1912.

Table 334

ılity from Cancer in the Republic of Costa Rica 1901-1912

	Population	Deaths from Cancer	Rate per 100,000 Population
	307,499	68	22.1
	312,819	84	26.9
	316,738	102	32.2
	322,618	111	34.4
	331,340	119	35.9
05	1,591,014	484	30.4
	334,297	122	36.5
	341,590	133	38.9
	351,176	154	43.9
	361,779	142	39.3
	368,780	140	38.0
10	1,757,622	691	39.3
	379,533	144	37.9
	388,266	171	44.0

e: Resúmenes Estadísticos. Años
10, San José, 1912.
blica de Costa Rica. Anuario Esta-
1911-1912.

Table 335

Mortality from Cancer in Nicaragua 1908-1911

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1908	530,000	80	15.1
1909	540,000	62	11.5
1910	550,000	42	7.6
1911	560,000	47	8.4
1908-1911	2,180,000	231	10.6

Source: Boletin de Estadística de la Republica de Nicaragua.

APPENDIX G

Table 336

Mortality from Cancer in the City of San Salvador, by Organs and Parts 1912

Organ or Part	Deaths from Cancer	Rate per 100,000 Population
Tongue	1	1.7
Throat	3	5.0
Stomach	11	18.5
Uterus	1	1.7
Not specified	17	28.6
Sarcoma	1	1.7
All organs	34	57.1

Source: Memoria de la Municipalidad de San Salvador, 1912.

Table 337

Mortality from Cancer in the Republic of Venezuela, 1905-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1905	2,608,033	407	15.6
1906	2,627,434	429	16.3
1907	2,646,835	396	15.0
1908	2,666,236	386	14.5
1909	2,685,637	346	12.9
1910	2,705,038	403	14.9
1906-1910	13,331,180	1,960	14.7
1911	2,724,439	437	16.0
1912	2,743,841	430	15.7

Source: Anuario Estadístico de Venezuela.

Table 338

Mortality from Cancer in the City of Bogotá, Colombia, 1912-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1912	121,257	112	92.4
1913	121,729	106	87.1
1912-1913	242,986	218	89.7

Source: Registro Municipal de Higiene, Bogotá.

Table 339

Mortality from Cancer in Guayaquil Ecuador, 1910-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1910*	40,000	23	57.5
1911	80,000	57	71.3
1912	80,000	42	52.5
1910-1912	200,000	122	61.0

Source: Original data furnished by Mr. Charles S. Hartman, envoy extraordinary and minister plenipotentiary, Quito, Ecuador.

*January to June.

Table 340

Mortality from Cancer in the City of La Paz, Bolivia, 1900-1909

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	59,633	2	3.4
1901	59,832	13	21.7
1902	60,031	18	30.0
1903	62,720	12	19.1
1904	65,409	10	15.3
1905	68,098	16	23.5
1901-1905	316,090	69	21.8
1906	70,787	18	25.4
1907	73,476	2	2.7
1908	76,166	6	7.9
1909	78,856	4	5.1

Source: Censo Municipal de la Ciudad de La Paz 15 de Junio de 1909.

APPENDIX G

Table 341
rtality from Cancer in the City of Lima, Peru, by Organs and Parts according to Sex, 1904

Organ or Part	Deaths from Cancer	Rate per 100,000 Population	Deaths from Cancer Males	Females
cavity................	4	3.1	2	2
ch and liver............	53	40.8	27	26
ıeum, intestines, rectum..	9	6.9	2	7
generative organs......	35	26.9	..	35
....	2	1.5	..	2
....	1	0.8	1	..
or not specified organs...	31	23.8	18	13
;ans....................	135	103.8	50	85

ırce: Datos Demograficos de la Ciudad de Limá en el Año de 1904.

Table 342
Mortality from Cancer in the City of Trujillo 1903-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1903	8,000	6	75.0
1904	8,000	8	100.0
1905	8,000	9	112.5
1903-1905	24,000	23	95.8
1906	8,000	7	87.5
1907	8,000	13	62.5
1908	8,000	16	200.0
1909	8,000	9	112.5
1910	8,000	12	150.0
1906-1910	40,000	57	142.5
1911	8,000	18	225.0
1912	8,000	14	175.0
1913	8,000	14	175.0

Source: Original data furnished by the Director of Registro Civil y Estadística, Trujillo, Peru.

APPENDIX G

Table 343
Mortality from Cancer in the City of Rio de Janeiro, Brazil
1891-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate pe[illegible] 100,00[illegible] Populati[illegible]
1891	440,118	151	34.3	1906	625,756	291	46.[illegible]
1892	450,636	153	34.0	1907	636,018	271	42.[illegible]
1893	461,411	149	32.3	1908	637,089	290	45.[illegible]
1894	472,454	152	32.2	1909	649,362	285	43.[illegible]
1895	483,773	164	33.9	1910	669,781	295	44.[illegible]
1891-1895	2,308,392	769	33.3	1906-1910	3,218,006	1,432	44.[illegible]
1896	405,380	167	33.7	1911	690,200	282	40.[illegible]
1897	507,286	168	33.1	1912	710,600	275	38.[illegible]
1898	519,503	189	36.4	1913	731,000	304	41.[illegible]
1899	532,042	179	33.6				
1900	544,917	199	36.5				
1896-1900	2,599,128	902	34.7				
1901	558,140	189	33.9				
1902	571,728	197	34.5				
1903	585,695	235	40.1				
1904	600,057	240	40.0				
1905	614,831	237	38.5				
1901-1905	2,930,451	1,098	37.5				

Source: Annuario Estatistico Dem[illegible] grapho-Sanitaria, Rio de Janeiro.

Table 344
Mortality from Cancer in the Federal District of Rio de Janeiro
1903-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1903	749,180	254	33.9
1904	771,276	260	33.7
1905	794,266	257	32.4
1906	811,443	318	39.2
1907	824,040	293	35.6
1908	825,812	313	37.9
1909	842,822	306	36.3
1910	870,475	334	38.4
1906-1910	4,174,592	1,564	37.5
1911	912,169	328	36.0
1912	965,766	312	32.3
1913	980,094	356	36.3

Source: Annuario Estatistico Demographo-Sanitaria, Rio de Janeiro.

APPENDIX G

Table 345

Mortality from Cancer in the Federal District of Rio de Janeiro by Organs and Parts, Males, 1906-1910

Organ or Part	1906	1907	1908	1909	1910	1906-10	Per Cent. of All Organs
Buccal cavity	29	13	17	20	14	93	12.5
Stomach	34	36	42	37	36	185	24.8
Liver	6	6	17	13	11	53	7.1
Peritoneum, intestines, rectum	6	5	11	9	10	41	5.5
Skin	9	16	9	9	5	48	6.5
Other or not specified organs	50	69	66	65	75	325	43.6
All organs	134	145	162	153	15	745	100.0

Source: Annuario Estatistico Demographo-Sanitaria, Rio de Janeiro.

Table 346

Mortality from Cancer in the Federal District of Rio de Janeiro by Organs and Parts, Females, 1906-1910

Organ or Part	1906	1907	1908	1909	1910	1906-10	Per Cent. of All Organs
Buccal cavity	6	4	2	2	7	21	2.6
Stomach	12	9	11	9	12	53	6.5
Liver	6	1	4	4	4	19	2.3
Peritoneum, intestines, rectum	5	8	5	5	9	32	3.9
Breast	13	11	9	15	16	64	7.8
Generative organs	66	50	58	52	50	276	33.7
Skin	4	2	7	3	1	17	2.1
Other organs	72	63	55	63	84	337	41.1
All organs	184	148	151	153	183	819	100.0

Source: Annuario Estatistico Demographo-Sanitaria, Rio de Janeiro.

APPENDIX G

Table 347
Mortality from Cancer in the City of Bahia
1897-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1897	196,394	32	16.3
1898	199,534	24	12.0
1899	202,673	38	18.7
1900	205,813	32	15.5
1897-1900	804,414	126	15.7
1901	213,400	47	22.0
1902	221,000	58	26.2
1903	228,600	72	31.5
1904	236,200	69	29.2
1905	243,800	53	21.7
1901-1905	1,143,000	299	26.2
1906	251,500	59	23.5
1907	259,200	54	20.8
1908	266,900	72	27.0
1909	274,600	71	25.9
1910	282,300	58	20.5
1906-1910	1,334,500	314	23.5
1911	290,000	68	23.4
1912	300,000	59	19.7

Source: Annuario de Estatistica Demographo-Sanitaria da Cidade do Salvador (Bahia), 1900-1908.
Boletin Mensal de Estatistica Demographo-Sanitaria da Cidade do Salvador, 1909-1912.

Table 348
Mortality from Cancer in the City of Bahia, Males
1900-1911

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	97,642	6	6.1
1901	101,200	12	11.9
1902	104,800	13	12.4
1903	108,400	18	16.6
1904	112,000	21	18.8
1905	115,600	17	14.7
1901-1905	542,000	81	14.9
1906	119,300	13	10.9
1907	123,000	15	12.2
1908	126,700	19	15.0
1909	130,400	22	16.9
1910	134,100	21	15.7
1906-1910	633,500	90	14.2
1911	137,800	21	15.2

Source: Annuario de Estatistica Demographo-Sanitaria da Cidade do Salvador (Bahia), 1900-1908.
Boletin Mensal de Estatistica Demographo-Sanitaria da Cidade do Salvador, 1909-1911.

APPENDIX G

Table 349
Mortality from Cancer in the City of Bahia, Females 1900-1911

Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1900	108,171	26	24.0	1906	132,200	46	34.8
				1907	136,200	39	28.6
1901	112,200	35	31.2	1908	140,200	53	37.8
1902	116,200	45	38.7	1909	144,200	49	34.0
1903	120,200	54	44.9	1910	148,200	37	25.0
1904	124,200	48	38.6				
1905	128,200	36	28.1	1906-1910	701,000	224	32.0
1901-1905	601,000	218	36.3	1911	152,200	47	30.9

Source: Annuario de Estatistica Demographo-Sanitaria da Cidade do Salvador (Bahia), 1900-1908.
Boletin Mensal de Estatistica Demographo-Sanitaria da Cidade do Salvador, 1909-1911.

Table 350
Mortality from Cancer in the City of Bahia, by Organs and Parts according to Sex, 1904-1908

Organ or Part	MALES Deaths from Cancer	MALES Rate per 100,000 Population	FEMALES Deaths from Cancer	FEMALES Rate per 100,000 Population
Buccal cavity	15	2.5	3	0.5
Stomach	13	2.2	9	1.4
Liver	6	1.0	9	1.4
Peritoneum, intestines, rectum	9	1.5	10	1.5
Female generative organs	..	..	94	14.2
Breast	..	..	20	3.0
Skin	8	1.3	6	0.9
Other or not specified organs	34	5.7	71	10.7
All organs	85	14.2	222	33.6

Source: Annuario de Estatistica Demographo-Sanitaria da Cidade do Salvador (Bahia).

APPENDIX G

Table 351
Mortality from Cancer in the City of Sao Paulo
1896-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1896	169,864	61	35.9
1897	187,353	51	27.2
1898	204,842	57	27.8
1899	222,331	48	21.6
1900	239,820	52	21.7
1896-1900	1,024,210	269	26.3
1901	248,000	66	26.6
1902	256,000	68	26.6
1903	264,000	84	31.8
1904	272,000	100	36.8
1905	280,000	89	31.8
1901-1905	1,320,000	407	30.8
1906	288,000	80	27.8
1907	296,000	128	43.2
1908	304,000	143	47.0
1909	312,000	117	37.5
1910	320,000	153	47.8
1906-1910	1,520,000	621	40.9
1911	358,000	156	43.6
1912	400,000	200	50.0
1913	450,000	201	44.7

Source: Estado de Sao Paulo. Directoria do Serviço Sanitario. Annuario Demographico, 1901-1912.

Table 352
Mortality from Cancer in the City of Sao Paulo, Males
1901-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	129,000	26	20.2
1902	133,000	32	24.1
1903	137,000	42	30.7
1904	141,000	55	39.0
1905	146,000	42	28.8
1901-1905	686,000	197	28.7
1906	150,000	36	24.0
1907	155,000	72	46.5
1908	160,000	72	45.0
1909	164,000	59	36.0
1910	168,000	77	45.8
1906-1910	797,000	316	39.6
1911	188,000	84	44.7
1912	210,000	102	48.6
1913	235,000	107	45.5

Source: Estado de Sao Paulo. Directoria do Serviço Sanitario. Annuario Demographico, 1901-1912.

Table 353
Mortality from Cancer in the City of Sao Paulo, Females
1901-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	119,000	40	33.6
1902	123,000	36	29.3
1903	127,000	42	33.1
1904	131,000	45	34.4
1905	134,000	47	35.1
1901-1905	634,000	210	33.1
1906	138,000	44	31.9
1907	141,000	56	39.7
1908	144,000	71	49.3
1909	148,000	58	39.2
1910	152,000	76	50.0
1906-1910	723,000	305	42.2
1911	170,000	72	42.4
1912	190,000	98	51.6
1913	215,000	94	43.7

Source: Estado de Sao Paulo. Directoria do Serviço Sanitario. Annuario Demographico, 1901-1912.

Table 354
Mortality from Cancer in the State of Paraná
1906-1910

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	351,341	37	10.5
1907	355,761.	32	9.0
1908	368,985	45	12.2
1909	380,000	38	10.0
1910	400,000	40	10.0
1906-1910	1,856,087	192	10.3

Source: Relatorio pelo el Director do Serviço Sanitario do Paraná; accompanhado da Estatistica Demographo-Sanitaria.

Table 355
Mortality from Cancer in the City of Pelotas
1906-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	32,308	27	83.6
1907	33,290	38	114.1
1908	34,272	29	84.6
1909	35,254	37	105.0
1910	36,243	26	71.7
1906-1910	171,367	157	91.6
1911	37,225	28	75.2
1912	38,207	27	70.7
1913	39,189	25	63.8

Source: Municipio de Pelotas. Relatorio apresentado ao Conselho Municipal, 1906-1913.

Table 356
Mortality from Cancer in the City of Bello Horizonte
1910-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1910	35,000	8	22.9
1911	37,435	17	45.4
1912	39,845	16	40.2
1910-1912	112,280	41	36.5

Source: Annuario de Estatistica Demographo-Sanitaria de Bello Horizonte.

Table 357
Mortality from Cancer in the Province of Buenos Aires, Argentina
1895-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1895	910,664	370	40.6
1896	955,258	438	45.9
1897	1,025,012	496	48.4
1898	1,074,119	511	47.6
1899	1,122,549	525	46.8
1900	1,177,381	627	53.3
1896-1900	5,354,319	2,597	48.5
1901	1,231,453	621	50.4
1902	1,269,452	656	51.7
1903	1,295,810	715	55.2
1904	1,331,959	759	57.0
1905	1,379,191	882	64.0
1901-1905	6,507,865	3,633	55.8
1906	1,462,287	896	61.3
1907	1,527,897	921	60.3
1908	1,600,465	994	62.1
1909	1,684,642	1,053	62.5
1910	1,865,192	1,084	58.1
1906-1910	8,140,483	4,948	60.8
1911	1,950,785	1,015	52.0
1912	2,069,610	1,100	53.2

Source: Dirección General de Estadistica de la Provincia de Buenos Aires: Memoria Demographica, 1895.
Anuario Estadistico, 1896-1897.
Demographia, 1898-1905.
Boletin Mensual de la Dirección de Estadistica, 1906-1912.

APPENDIX G

Table 358
Mortality from Cancer in the Province of Buenos Aires, Males 1895-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1895	512,431	209	40.8
1896	537,524	247	46.0
1897	576,774	279	48.4
1898	604,407	305	50.5
1899	631,658	286	45.3
1900	662,865	397	59.9
1896-1900	3,013,228	1,514	50.2
1901	693,308	342	49.3
1902	714,701	379	53.0
1903	729,541	426	58.4
1904	749,893	462	61.6
1905	776,484	533	68.6
1901-1905	3,663,927	2,142	58.5
1906	823,268	543	66.0
1907	860,206	554	64.4
1908	901,061	588	65.3
1909	950,138	653	68.7
1910	1,051,968	634	60.3
1906-1910	4,586,641	2,972	64.8
1911	1,100,243	589	53.5
1912	1,167,260	647	55.4

Source: Dirección General de Estadistica de la Provincia de Buenos Aires: Memoria Demographica, 1895.
Anuario Estadistico, 1896-1897.
Demographia, 1898-1905.
Boletin Mensual de la Dirección de Estadistica, 1906-1912.

Table 359
Mortality from Cancer in the Province of Buenos Aires, Females 1895-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1895	398,233	161	40.4
1896	417,734	191	45.7
1897	448,238	217	48.4
1898	469,712	206	43.9
1899	490,891	239	48.7
1900	514,516	230	44.7
1896-1900	2,341,091	1,083	46.3
1901	538,145	279	51.8
1902	554,751	277	49.9
1903	566,269	289	51.0
1904	582,066	297	51.0
1905	602,707	349	57.9
1901-1905	2,843,938	1,491	52.4
1906	639,019	353	55.2
1907	667,691	367	55.0
1908	699,404	406	58.0
1909	734,504	400	54.5
1910	813,224	450	55.3
1906-1910	3,553,842	1,976	55.6
1911	850,542	426	50.1
1912	902,350	453	50.2

Source: Dirección General de Estadistica de la Provincia de Buenos Aires: Memoria Demographica, 1895.
Anuario Estadistico, 1896-1897.
Demographia, 1898-1905.
Boletin Mensual de la Dirección de Estadistica, 1906-1912.

Table 360
Mortality from Cancer in the City of Buenos Aires
1882-1913

	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
	362,373	192	53.0	1901	854,988	723	84.6
	376,573	177	47.0	1902	886,986	763	86.0
	390,773	170	43.5	1903	918,984	864	94.0
	404,973	218	53.8	1904	950,981	890	93.6
	419,173	213	50.8	1905	1,007,124	950	94.3
6	1,953,865	970	49.6	1901-1905	4,619,063	4,190	90.7
	490,779	352	71.7	1906	1,063,267	982	92.4
	519,482	308	59.3	1907	1,119,410	983	87.8
				1908	1,175,553	1,030	87.6
	548,185	324	59.1	1909	1,231,698	1,026	83.3
	576,888	370	64.1	1910	1,282,353	1,034	80.6
	605,591	427	70.5				
	634,293	442	69.7	1906-1910	5,872,281	5,055	86.1
	663,000	461	69.5				
				1911	1,333,008	1,175	88.1
5	3,027,957	2,024	66.8	1912	1,383,663	1,210	87.4
				1913	1,434,318	1,266	88.3
	694,998	514	74.0				
	726,996	629	86.5				
	758,994	554	73.0				
	790,992	614	77.6				
	822,990	748	90.9				
0	3,794,970	3,059	80.6				

Source: Year-Book of the City of Buenos Aires.

Table 361
Mortality from Cancer in the City of Buenos Aires, Males
1896-1913

	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
	372,102	301	80.9	1906	558,640	607	108.7
	388,070	359	92.5	1907	589,593	584	99.1
	403,937	314	77.7	1908	620,692	632	101.8
	419,700	351	83.6	1909	651,938	617	94.6
	435,362	439	100.8	1910	680,416	622	91.4
0	2,019,171	1,764	87.4	1906-1910	3,101,279	3,062	98.7
	451,006	441	97.8	1911	708,361	733	103.5
	466,555	485	104.0	1912	736,109	720	97.8
	482,007	503	104.4	1913	763,660	742	97.2
	497,363	548	110.2				
	527,934	562	106.5				
5	2,424,865	2,539	104.7				

Source: Year-Book of the City of Buenos Aires.

Table 362
Mortality from Cancer in the City of Buenos Aires, Females 1896-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1896	322,896	213	66.0	1906	504,627	375	74.3
1897	338,926	270	79.7	1907	529,817	399	75.3
1898	355,057	240	67.6	1908	554,861	398	71.7
1899	371,292	263	70.8	1909	579,760	409	70.5
1900	387,628	309	79.7	1910	601,937	412	68.4
1896-1900	1,775,799	1,295	72.9	1906-1910	2,771,002	1,993	71.9
1901	403,982	282	69.8	1911	624,647	442	70.8
1902	420,431	278	66.1	1912	647,554	490	75.7
1903	436,977	361	82.6	1913	670,658	524	78.1
1904	453,618	342	75.4				
1905	479,190	388	81.0				
1901-1905	2,194,198	1,651	75.2				

Source: Year-Book of the City of Buenos Aires.

Table 363
Mortality from Cancer in the City of Buenos Aires, by Organs and Parts according to Sex, 1907-1911

Organ or Part	MALES Deaths from Cancer	MALES Rate per 100,000 Population	FEMALES Deaths from Cancer	FEMALES Rate per 100,000 Population
Buccal cavity	210	6.46	33	1.14
Stomach and liver	1,740	53.52	677	23.42
Peritoneum, intestines, rectum	147	4.52	131	4.53
Female generative organs	..	..	532	18.40
Breast	..	..	137	4.74
Skin	66	2.03	24	0.83
Other or not specified organs	1,025	31.53	526	18.19
All organs	3,188	98.06	2,060	71.25

Source: Year-Book of the City of Buenos Aires.

Table 364
Mortality from Cancer in the City of Rosario de Santa Fé
1904-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1904	128,078	83	64.8
1905	130,565	91	69.7
1906	141,127	123	87.2
1907	151,887	91	59.9
1908	160,225	112	69.9
1909	171,796	121	70.4
1910	187,428	156	83.2
1906-1910	812,463	603	74.2
1911	203,886	145	71.1
1912	214,269	150	70.0
1913	225,600	138	61.2

Source: Anuario Estadístico de la Ciudad del Rosario de Santa Fé.
Boletin Mensual de Estadística Municipal de la Ciudad del Rosario de Santa Fé.

Table 365
Mortality from Cancer in the City of Rosario de Santa Fé, Males
1904-1911

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1904	68,599	45	65.6
1905	69,970	50	71.5
1906	75,672	76	100.4
1907	81,487	52	63.8
1908	86,009	62	72.1
1909	92,289	70	75.8
1910	100,761	84	83.4
1906-1910	436,218	344	79.0
1911	109,691	88	80.2

Source: Anuario Estadístico de la Ciudad del Rosario de Santa Fé.

Table 366
Mortality from Cancer in the City of Rosario de Santa Fé, Females
1904-1911

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1904	59,479	38	63.9
1905	60,595	41	67.7
1906	65,455	47	71.8
1907	70,400	39	55.4
1908	74,216	50	67.4
1909	79,507	51	64.1
1910	86,667	72	83.1
1906-1910	376,245	259	68.8
1911	94,195	57	60.5

Source: Anuario Estadístico de la Ciudad del Rosario de Santa Fé.

Table 367
Mortality from Cancer in the Province of Tucumán
1901-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1901	252,098	46	18.2
1902	254,762	44	17.3
1903	257,427	47	18.3
1904	263,079	40	15.2
1905	269,617	39	14.4
1901-1905	1,296,983	216	16.7
1906	291,230	39	13.4
1907	299,241	36	12.0
1908	311,600	48	15.4
1909	312,519	55	17.6
1910	320,933	57	17.8
1906-1910	1,535,523	235	15.3
1911	325,209	62	19.1
1912	329,485	75	22.8

Source: Anuario de Estadistica de la Provincia de Tucumán correspondiente al Ano de 1910.

APPENDIX G

Table 368
Mortality from Cancer in the City of Santiago del Estero
1891-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	11,805	2	16.9
1892	12,036	3	24.9
1893	12,272	5	40.7
1894	12,512	6	48.0
1895	12,892	6	46.5
1891-1895	61,517	22	35.8
1896	13,324	12	90.1
1897	13,657	9	65.9
1898	13,989	6	42.9
1899	14,290	2	14.0
1900	14,698	1	6.8
1896-1900	69,958	30	42.9
1901	15,066	7	46.5
1902	15,339	6	39.1
1903	15,556	..	..
1904	15,827	5	31.6
1905	16,168	7	43.3
1901-1905	77,956	25	32.1

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	16,578	4	24.1
1907	17,170	16	93.2
1908	17,852	11	61.6
1909	18,534	3	16.2
1910	19,216	8	41.6
1906-1910	89,350	42	47.0
1911	19,898	3	15.1
1912	20,580	11	53.4
1913	21,262	8	37.6

Source: Direccion General de Estadistica y Registro Civil de la Provincia de Santiago del Estero. Mortalidad General, 1890-1908.

1909-1913 by correspondence with Direccion General de Estadistica y Registro Civil, Santiago del Estero.

Table 369
Mortality from Cancer in the Republic of Chile
1892-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1892	2,645,408	457	17.3
1893	2,664,190	455	17.1
1894	2,683,105	546	20.3
1895	2,712,145	426	15.7
1896	2,753,369	554	20.1
1892-1896	13,458,217	2,438	18.1
1903	3,060,807	894	29.2
1904	3,107,331	1,194	38.4
1905	3,154,561	954	30.2
1903-1905	9,322,699	3,042	32.6

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1906	3,202,510	1,209	37.8
1907	3,249,279	1,251	38.5
1908	3,297,585	1,434	43.5
1909	3,347,124	1,369	40.9
1910	3,416,060	1,089	31.9
1906-1910	16,511,558	6,352	38.5
1911	3,483,000	1,031	29.6
1912	3,505,017	1,154	32.9

Source: Poblacion Calculada de la Republica de Chile en 1910 i Resena del Movimiento de Poblacion del mismo ano. Santiago del Chile, 1912.

Report of the Registrar-General for England and Wales, 1912.

Table 370
Mortality from Cancer in the Province of Santiago de Chile
1904-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1904	487,021	266	54.6
1905	496,904	321	64.6
1906	506,887	406	80.1
1907	516,870	301	58.2
1908	526,853	301	57.1
1909	536,836	399	74.3
1910	546,819	373	68.2
1906-1910	2,634,265	1,780	67.6
1911	556,803	270	48.5
1912	566,787	328	57.9

Source: Correspondence from Direccion General de Estadistica de Chile.

Table 371
Mortality from Cancer in the City of Santiago de Chile
1898-1909

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1898	270,704	250	92.4
1899	275,638	272	98.7
1900	281,886	296	105.0
1901	288,645	222	76.9
1902	295,059	230	78.0
1898-1902	1,411,932	1,270	89.9
1903	302,538	251	83.0
1904	309,510	223	72.0
1905	317,420	233	73.4
1906	324,057	204	63.0
1907	332,724	218	65.5
1903-1907	1,586,249	1,129	71.2
1908	340,210	234	68.8
1909	347,864	293	84.2

Source: Correspondence from Direccion General de Estadistica de Chile.

Table 372
Mortality from Cancer in the City of Santiago de Chile, by Organs and Parts
1898-1902

Organ or Part	No. of Deaths	Per Cent.
Head	2	0.26
Face	10	1.31
Lips	1	0.13
Mouth and tongue	17	2.22
Jaw	2	0.26
Larynx and throat	12	1.57
Spine	2	0.26
Lungs	6	0.78
Œsophagus	7	0.91
Stomach	367	47.91
Rectum	20	2.61
Other intestines	40	5.22
Liver	117	15.29
Kidney, spleen and pancreas	8	1.04
Bladder	14	1.83
Uterus and ovaries	89	11.62
Breast	9	1.17
Not specified	43	5.61
All organs	766	100.00

Source: Zeitschrift für Krebsforschung. 3. Band.
Note: Includes carcinoma only.

APPENDIX G

Table 373
Mortality from Cancer in the Republic of Uruguay
1891-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population	Year	Population	Deaths from Cancer	Rate per 100,000 Population
1891	708,168	277	39.1	1901	931,527	495	53.1
1892	728,447	335	46.0	1902	947,407	481	50.8
1893	748,130	346	46.2	1903	963,287	501	52.0
1894	776,314	340	43.8	1904	979,166	531	54.2
1895	792,800	350	44.1	1905	995,046	587	59.0
1891-1895	3,753,859	1,648	43.9	1901-1905	4,816,433	2,595	53.9
1896	818,843	411	50.2	1906	1,010,926	667	66.0
1897	827,485	401	48.5	1907	1,026,806	695	67.7
1898	840,725	481	57.2	1908	1,042,686	662	63.5
1899	878,186	468	53.3	1909	1,080,070	704	65.2
1900	915,647	423	46.2	1910	1,117,454	757	67.7
1896-1900	4,280,886	2,184	51.0	1906-1910	5,277,942	3,485	66.0
				1911	1,154,838	732	63.4
				1912	1,192,222	838	70.3
				1913	1,229,606	903	73.4

Source: Anuario Estadistico de la Republica Oriental del Uruguay.

Table 374
Mortality from Cancer in the Republic of Uruguay, Males
1905-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1905	506,279	340	67.2
1906	514,359	375	72.9
1907	522,439	395	75.6
1908	530,519	389	73.3
1909	549,540	396	72.1
1910	568,561	429	75.5
1906-1910	2,685,418	1,984	73.9
1911	587,582	431	73.4
1912	606,603	477	78.6

Source: Anuario Estadistico de la Republica Oriental del Uruguay.

Table 375
Mortality from Cancer in the Republic of Uruguay, Females
1905-1912

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1905	488,767	247	50.5
1906	496,567	292	58.8
1907	504,367	300	59.5
1908	512,167	273	53.3
1909	530,530	308	58.1
1910	548,893	355	64.7
1906-1910	2,592,524	1,528	58.9
1911	567,256	301	53.1
1912	585,619	361	61.6

Source: Anuario Estadistico de la Republica Oriental del Uruguay.

APPENDIX G

Table 376

ity from Cancer in the Republic of Uruguay, by Organs and Parts according to Sex. Rate per 100,000 of Population

1906-1910

Organ or Part	Persons	Males	Females
ıvity	2.0	3.6	0.4
and liver	35.6	44.4	26.5
ım, intestines and rectum	4.6	4.2	4.9
enerative organs	6.0	..	12.2
	1.8	..	3.7
	1.1	1.6	0.5
not specified organs	14.9	19.4	10.4
ıs	66.0	73.2	58.6

e: Anuario Estadistico de la Republica Oriental del Uruguay.

Table 377

Mortality from Cancer in the City of Montevideo

1903-1913

Year	Population	Deaths from Cancer	Rate per 100,000 Population
1903	282,689	295	104.4
1904	289,018	260	90.0
1905	298,533	320	107.2
1906	307,482	347	112.9
1907	309,904	385	124.2
1908	313,016	364	116.3
1909	321,224	403	125.5
1910	329,888	406	123.1
1906-1910	1,581,514	1,905	120.5
1911	338,353	364	107.6
1912	355,017	400	126.7
1913	370,000	450	121.6

Source: Resumen Anual de Estadistica Municipal, Montevideo.

Table 378

ılity from Cancer in the City of Montevideo, by Organs and Parts

1907-1911

Organ or Part	Deaths from Cancer	Rate per 100,000 Population
ıvity	57	3.5
and liver	1,030	63.9
ım, intestines and rectum	128	7.9
enerative organs	172	10.7
	53	3.3
	20	1.2
not specified organs	462	28.7
s	1,922	119.2

e: Resumen Anual de Estadistica Municipal, Montevideo.

APPENDIX

H

Recommendations and Instructions on the Control of Cancer

Table		Page
1	Recommendations to The American Gynecological Society for the National Control of Cancer, by Frederick L. Hoffman	777
2	Purpose and Methods of Work of The American Society for the Control of Cancer	779
3	Instructions on Prevention of Cancer Issued by the Borough of Portsmouth, England	781
4	Report on the Prevention of Cancer of the Medical Officer of Health of the Borough of Shelf, England	783

APPENDIX H

Table 1

ecommendations to The American Gynecological Society, May 7, 1913, for the National Control of Cancer, by Frederick L. Hoffman

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RECOMMENDATIONS

1. The organization of an American society* for the study and pre-:ntion of cancer, primarily for the purpose of educating the public . large in the absolute necessity of operative treatment at the earliest dications of cancerous growths.

2. A thorough investigation into the geographical distribution of ıncer throughout the western hemisphere, but with special reference localities and sections which persistently show a very high or a :ry low rate of cancer mortality.

3. A thoroughly qualified medical and statistical investigation into ie cancer experience data of general and cancer hospitals for a period sufficient length to determine the precise results of medical and surgi-l treatment, with a due regard to the after-lifetime, possible recur-nce, or subsequent death of patients discharged as cured or materially ıproved.

4. A nation-wide agitation for a material improvement and required mpleteness of the official returns of deaths from cancer, with a due gard to the organs or parts affected, for the purpose of reducing the ımber and proportion of unclassified or ill-defined cancers to the lowest ıssible minimum.

5. The Division of Vital Statistics of the Census, as well as all state d municipal boards of health in charge of the registration, tabulation, d analysis of vital statistics should be urged to redistribute the deaths curring in institutions, according to the permanent or regular resi-nce of the deceased. Only by means of such a correction can the ıe local incidence of cancer be established, as has been shown with mirable clearness by the investigations of Green, of Edinburgh.

6. A thoroughly scientific investigation, through the cooperation the Census Office, the Bureau of Labor, the Bureau of Mines, life ıurance companies, etc., should be made into the occupational inci-nce of cancer, with regard to which there are strong reasons for lieving that a wealth of useful information can be brought to light ıich is at present unavailable.

7. Since an erroneous diet is a probable causative factor in cancer currence, the nutrition of cancerous patients should be investigated conformity to the strictly scientific and conclusive methods of Pro-ssors Atwater and Chittenden.

*"The American Society for the Control of Cancer" was formed in the city of New York on May 22, 1913.

APPENDIX H

Table 1 (concluded)

Recommendations to The American Gynecological Society, May 7, 1913, for the National Control of Cancer, by Frederick L. Hoffman

8. As an aid in the scientific study of cancer, and as a possible means of bringing about a more intelligent public understanding of the accepted facts of cancer occurrence, its nature and probable cure, the disease should be made reportable to the local Board of Health in the same manner as other diseases which are a recognized menace to public health and welfare.

9. As a further aid, the Department of Agriculture should be requested to make a thorough study of the occurrence of cancer among domestic animals and plants known, or suspected, to be subject thereto, and such an investigation should, as far as practicable, be coordinated to the work of the Bureau of Soils.

10. The immediate preparation and widest possible distribution of a concise outline of accepted cancer facts, showing the disease in all cases to be of local origin, that the chief danger to the patient lies in the tendency toward a rapid extension of cancerous growths, that the only certain remedy known to science is the complete surgical removal of the affected parts at the earliest possible indication of the disease, and that when this is done the outlook for a cure in the accepted sense of the term is decidedly hopeful, but that to the contrary delay and neglect, or refusal to submit to operative treatment, are practically certain to result fatally within a comparatively short period of time.

APPENDIX H

Table 2
Purpose and Methods of Work of The American Society for the Control of Cancer

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The American Society for the Control of Cancer

PURPOSE

To disseminate knowledge concerning the symptoms, diagnosis, tment and prevention of cancer, to investigate the conditions under :h cancer is found and to compile statistics in regard thereto."

ITS PROBLEM

ancer is one of the chief causes of death. It claims about 75,000 every year in the United States. At ages over forty the disease es one death in eight among women, and one death in fourteen ng men. It is preeminently a disease of adult life, and at ages over 7 is a greater menace than tuberculosis or pneumonia. Its insidious :t often occurs at the most useful period of life, when the father and her are of the greatest service to society.

ITS OPPORTUNITY

[uch is known about cancer, but the present knowledge is not suf- ntly utilized. Cancer is not a constitutional or blood disease, but : first a local growth, which can at that time be easily removed by npt surgical operation. This is the only known cure, and the chief of controlling the disease lies in a careful campaign of public ation in regard to the many well-known conditions under which er develops, the first signs, and the vital importance of its early gnition and prompt removal.

ITS ORGANIZATION AND AIMS

he American Society for the Control of Cancer was established by a p of prominent men and women who were deeply impressed by e facts and saw the need of a national agency to conduct statistical stigations, organize local campaigns and promote educational work is field similar to that of the National Association for the Study Prevention of Tuberculosis.

ological research, the treatment of individual cases and the main- nce of hospitals or clinics are not comprehended in the design of the ety. Educational publicity is the first and the chief object.

ITS ENDORSEMENTS

1e Society has received the official approval of the American Medical ciation, the American Surgical Association, the American Gynecolog- Society, the Clinical Congress of Surgeons, the Western and South- Surgical Associations and the various special medical societies of onal scope which together constitute the American Congress of sicians and Surgeons. Numerous state and local medical societies also given their endorsement and their active assistance in the work.

APPENDIX H

Table 2 (concluded)

Purpose and Methods of Work of The American Society for the Control of Cancer*

Methods of Work

PUBLICITY AND EDUCATION

A press bureau, carefully supervised by distinguished medical experts, causes the regular publication of instructive articles in a large number of newspapers all over the country.

Special articles are prepared for medical journals, health department bulletins and popular magazines. Leaflets and circulars are printed and distributed by mail, at meetings and through local agencies. The cooperation of boards of health, insurance companies, womens' clubs, industrial and welfare organizations and similar agencies is obtained and much additional educational work is thus stimulated.

MEETINGS AND LECTURES

Large public meetings have been organized in Chicago, St. Louis, Pittsburgh, Boston, Portland, New York and other cities.

A lecture bureau has been established, and well-qualified speakers are supplied without expense for these and smaller meetings under the auspices of appropriate organizations.

Special effort is made to instruct nurses and social workers as to the elementary facts about cancer, in order that they may spread this necessary and life-saving knowledge among the people, especially women, with whom they come in contact in the course of their duties.

LOCAL WORK

Branch committees of the National Society are set up in every city where the interest warrants such action. In organizing local campaigns the cooperation of state and city boards of health is particularly sought and health officials are furnished with facts, statistics and articles for educational work of their own in this field.

STATISTICAL RESEARCH

A series of special record forms has been prepared for use in various hospitals. A careful study of facts about the disease and the results of treatment is thus being made, and all new knowledge developed thereby will be given to the public.

The cooperation of the United States Census Bureau, state boards of health and individual physicians has been obtained in improving the reporting and publication of cancer statistics.

*Executive office, 105 East 22d St., New York, N. Y.

APPENDIX H

Table 3

Instructions on Prevention of Cancer, Issued by the Borough of Portsmouth, England

NOTICE IN REGARD TO CANCER

Borough of Portsmouth

It has been brought to the notice of the health committee that of the mber of persons who die each year from cancer many could have been red if they had applied earlier for medical advice. On questioning tients as to why they did not apply to a doctor earlier, the reason nost invariably given is that as the early symptoms were unaccomnied by pain, it was not thought that anything serious was the matter.

In order, therefore, to call the attention of the public to the signifiice of certain symptoms and conditions, and to the vital importance acting promptly on the occurrence of these, it has been decided to ike the following facts public:

The only cure for cancer, at present known, is its early and comte removal. Cancer, if removed early, has been proved conclusively be a curable disease. If neglected, and not removed in its earliest ige, it is practically invariably fatal. The paramount importance its early recognition and early removal is, therefore, evident. For is purpose the assistance both of the public and the medical profession requisite, and a grave responsibility rests on both. It is only by eir mutual co-operation that the ravages of this terrible disease can be sened. The following information should be of vital assistance to e public. It is no exaggeration to say that, if acted upon, the result uld be the saving annually of many hundreds of lives, which at esent are inevitably lost.

1. Cancer, in its early and curable stage, gives rise to no pain or mptom of ill-health whatever.

2. Nevertheless, in its commonest situations, the signs of it in its rly stage are conspicuously manifest. To witness:

3. In case of any swelling occurring in the breast of a woman after years of age, a medical man should at once be consulted. A large oportion of such swellings are cancer.

4. Any bleeding, however trivial, occurring after the change of life eans almost invariably cancer, and cancer which is then curable. If glected till pain occurs, it means cancer which is almost always curable.

5. Any irregular bleeding occurring at the change of life should invaably be submitted to a doctor's investigation. It is not the natural ethod of the onset of the change of life, and in a large number of ses means commencing cancer.

APPENDIX H

Table 3 (concluded)

Instructions on Prevention of Cancer, Issued by the Borough of Portsmouth, England

6. Any wart or sore occurring spontaneously on the lower lip in a man over 45 years of age is almost certainly cancer. If removed at once the cure is certain, if neglected the result is inevitably fatal.

7. Any sore or swelling occurring on the tongue or inside of the mouth in a man after 45 years of age should be submitted to investigation without a moment's delay, and the decision at once arrived at by an expert microscopical examination whether it is cancer or not. A very large proportion of such sores or swellings occurring at this time of life are cancer, and if neglected for only a few weeks the result is almost inevitably fatal. If removed at once the prospect of cure is good.

8. Any bleeding occurring from the bowel after 45 years of age, commonly supposed by the public to be "piles," should be submitted to investigation at once. A large proportion of such cases are cancer, which at this stage is perfectly curable.

9. When warts, moles, or other growths on the skin are exposed to constant irritation they should be immediately removed. A large number of them, if neglected, terminate in cancer.

10. Avoid irritation of the tongue and cheeks by broken jagged teeth, and of the lower lip by clay pipes. Many of these irritations, if neglected, terminate in cancer.

11. Although there is no evidence that cancer is communicable under ordinary circumstances, it is desirable that rooms occupied by a person suffering from cancer should be cleaned and disinfected from time to time.

A. Mearns Fraser, M.D.,
Medical Officer of Health.

Health Department,
Town Hall, Portsmouth.
January, 1914.

APPENDIX H

Table 4

Report on the Prevention of Cancer of the Medical Officer of Health of the Borough of Shelf, England

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URBAN DISTRICT COUNCIL OF SHELF

port of the Medical Officer of Health on the Prevention of Cancer

ery successful efforts are now being made to reduce the general h rate of this country by informing the public as to the methods of ention of the most fatal forms of disease, and thereby obtaining r assistance. Until quite recently the lay public were kept in rance—except through occasional and not too accurate articles in public press—of the vital subject of tuberculosis, but it is now ized that little harm and very much good has been done by teaching ole how to prevent consumption. So, too, the prevention of cancer t not be delayed because of a few nervous persons, for it is perfectly ible to state some very important facts regarding cancer without oking morbid self-examination or fear.

he object of this report, therefore, is to give such facts in regard his disease, which, if generally known and acted upon, would save many lives annually.

o cancer "parasite" has been found, and there seems much evice to support the view that it is a *natural* response to injury.

n overwhelming testimony of facts proves that the chief causative ience in its production is *chronic irritation*, i.e., it begins in a sore e, perhaps a mere crack, which does not quite heal up because, from osition, it cannot be kept clean or obtain perfect rest.

revent this *chronic irritation* and you will prevent cancer!

eeping in mind this all-important fact, the causation and prevention he more common forms of cancer are here considered:

he three more common situations are the breast, the stomach and uterus.

Breast.—The evidence is very strongly in favour of the cause be- *chronic irritation*, the result of repeated "nursing" (lactation) and cks of chronic inflammation due to "cracked nipples" which do heal.

revention.—Corsets which press the nipples inwards should be ided, "cracked nipples" completely cured, and a doctor consulted y about any "lump" in the breast, whether this be painful or not. ay not be by any means necessarily a "growth," but it should receive tment.

Stomach.—About half the cases of cancer of the stomach dep at the seat of a neglected unhealed ulcer.

revention.—*Very persistent* chronic indigestion should not be neged too long. Continued "*chronic irritation*" anywhere is undeble and should be avoided. Ulcers of the stomach, which are

Table 4 (continued)
Report on the Prevention of Cancer of the Medical Officer of Health of the Borough of Shelf, England

often due to bad teeth and anæmia, must be permanently cured and not neglected, as is often the case, for years.

3. *Uterus.*—Cancer of this organ is almost exclusively confined to mothers and due to injuries at childbirth, which very simple remedies would heal.

Prevention.—Irregular hemorrhage at the "change of life," and especially—though slight and unassociated with pain—occurring *after* the "change," renders it wise to consult a doctor. Such symptoms by no means necessarily imply cancer, but this disease can often be prevented if a medical man be consulted early under these circumstances.

4. *Lip.*—Its victims are nearly all smokers, its position on the *lower* lip and practically *never* on the upper one. It was very common when sticky clay pipes, which readily became hot, were used, and its cause is *chronic irritation.*

Prevention.—It is a simple matter to see that little cracks about the lip, nose and ears are healed up.

5. *Chimney-Sweep's Cancer.*—This, which may occur in various parts of the body, is due to *constant irritation* of soot and dust. Employees who work at gas and tar works, and who get their clothes saturated with irritating substances, are also liable to this disease.

Prevention.—This form of cancer is not nearly so common now that sweeps are cleaner in their habits and work. It is wise to have warts, moles and papillary growths occurring on any part of the body removed.

6. *Tongue and Mouth.*—Warty and papillary growths and simple ulcers about the mouth are frequently due to *chronic irritation* from smoking, bad teeth, etc.

Prevention.—When these are present, sources of *irritation*, e.g., hot liquids, alcohol, smoking, should be avoided. All broken or jagged teeth should be extracted, and any troublesome sore investigated.

7. *Larynx.*—The decrease in cancer of the "voice box" is due to the fact that those conditions which contribute to their development are now recognised early and relieved by treatment.

Prevention.—The conditions here mentioned are the improper use of the voice, the abuse of alcohol and tobacco, and the presence of "innocent" warts.

8. *Gullet.*—Cancer of the "food pipe" usually follows upon *chronic irritation* of simple ulcers caused by indigestion or swallowing corrosive substances or hot liquids.

Prevention.—Simple ulcers should be healed and *hot* liquids should not be swallowed.

APPENDIX H

Table 4 (concluded)

Report on the Prevention of Cancer of the Medical Officer of Health of the Borough of Shelf, England

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9. *Intestine.*—Most of these cancers are of the *lower* bowel, and no doubt due to the *chronic irritation* of constipation.

Prevention.—It is wise to consult a doctor as to any bleeding from the bowel occurring in persons over 45 years of age. Of course this may be due to hæmorrhoids ("piles"). Chronic constipation, as well as chronic diarrhœa, should be cured.

10. *Gall-Bladder.*—The chief danger of the long-continued presence of gallstones is the occurrence of cancer as an expression of *continued irritation.*

Prevention.—Persons who have had gallstone colic should have the gallstones removed. This is not at all a serious operation.

Cancer, if removed early, has been proved to be a curable disease, and the reason almost invariably given for not having seen a doctor earlier was that the early symptoms were unaccompanied by pain.

Although cancer is probably not communicable under ordinary circumstances, it is desirable that rooms occupied by a person suffering from cancer should be cleaned and disinfected from time to time.

J. Aspinall Marsden, M.O.H.,
Diploma in Public Health.

Urban District Council Offices, Shelf.
July 1, 1914.

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A complete list of the literature available in connection with the subjects specified in the table of contents has not been attempted. The present bibliography is limited to the more important works and articles consulted and made use of, most of which are in the library of The Prudential. The references relating particularly to life insurance and cancer have been separately listed, all being arranged alphabetically by authors or titles. Treatises published in book form are indicated by an asterisk placed before the author's name.

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Vol. I: Theory of atra bilis, 1-53; lymph theory, 55-121; blastemic theory, 123-215; cellular pathology and its importance in cancer study, 217-325; embryonic theory, 327-409; cell theories, 409-518; parasitic theories, 519-710; index to vol. i.

Vol. II: Biological etiology, 1-122; clinical etiology, 123-154; precancerous diseases, 155-272; relation of cancer to other diseases, 273-293; special forms of cancer, 295-346; general clinical aspects of cancer problem, 347-481; general diagnosis of cancer, 483-521; primary cancer of digestive organs, 523-776; primary cancer of respiratory organs, 777-853; primary cancer of the urogenital system, 857-1042; primary cancer of the glands and glandular organs 1043-1177; primary cancer of the eyes and ears, 1179-1218; index to vol. ii.

Vol. III, part 1: general statistical investigations concerning cancer occurrence, 1-96; special statistical investigations concerning cancer occurrence, 97-201; animal and so-called plant cancers, 203-347.

Part 2: non-operative methods of cancer treatment—medicinal, 1-272; physical-dietetic treatment of cancer, 273-426; biological methods of treatment of cancer, 427-578; index to parts 1 and 2, vol. iii.

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INDEX OF AUTHORS

ɪᴍs, Adolphe, 4
J. G., 202, 205
. A., 78
s, E., 41
. J. T., 58, 62
n, Alfred, 68, 69
Miss E., 154
r, W. O., 777
ch, E., 149

ɪᴅɢᴇ, William Seaman, 41, 128,
), 184, 210
B. E., 67
Mitchell, 22
d, E. F., 3, 14, 17, 18, 25, 27, 34, 35,
41, 42, 43, 44, 131, 153, 172, 199,
), 283
E., 190
, *Sir* George T., 204
James, 79, 80, 82
R., 197, 203
njamin, 6, 22
F. W., 190
mann, Johann Philip, 174
n, Jacques, 73, 276-282
d, Stephen, 22
Sutton, J., 156
ood, Joseph C., 155, 171, 213, 215
Franz, 183, 193
H. J., 214
A., 205
Max, 4
vaite, J., 148
waite, R. W., 189
, W., 78
ank, E. M., 79
W. A., 215
K., 160
, L. D., 174, 178
Sir H. T., 51

Richard C., 4
M., 188
Aurelius Cornelius, 5
iliac, Guy, 187
Chas. F., 57, 164, 185, 190, 196, 215
den, Russell H., 175, 178, 179, 777
, F. G., 105
n, T. S., 208
im, Julius, 6, 60, 202, 205
Wm. B., 22, 139
E. E. L., 4
White, Ellen P., 176
Louis Bradford, 186
. W., 207

Cripps, W. Harrison, 172
Cropper, J. W., 69
Cullen, Thomas S., 157-158
Curie, Mme., 211
v. Czerney, V., 213

Davidson, Andrew, 105
Degrais, Paul (see Wickham and Degrais)
Delafield, Francis, 8, 9, 10 (see Delafield and Prudden)
Delafield and Prudden, 9, 10, 25, 167, 198
Dennis, Frederick S., 128
Dollinger, Julius, 151, 315
Dore, S. E., 211
Dublin, Louis, 4
Dührssen, Alfred, 213, 214
Dunn, H. P., 24, 174

Emerson, C. P., 170
v. Esmarch, F., 190
d'Etiolles, Leroy, 189
Ewing, James, 43, 158, 297, 299, 301, 303

Fabre, Pierre, 189
Farr, William, 29, 104
Fenwick, P. C. (see Hislop and Fenwick)
Fishberg, Maurice, 148, 149
Forrest, E. D., 208
Fox, H., 34
Fraser, A. Mearns, 216, 782
French, Herbert, 5, 22, 170, 183
Frerichs, F. T., 193
Frief, F., 206

Gairdner, W. T., 81
Galen, Claudius, 5, 6
Gastpar, 76
Gavales, S. A., 699
Gaylord, H. R., 121, 180, 181, 203 (see Gaylord and Marsh)
Gaylord and Marsh, 181
Gilford, Hastings, 4, 14, 153, 168, 184, 193
Gould, *Sir* Alfred Pearce, 184
Gould, G. M. (see Gould and Pyle)
Gould and Pyle, 11, 34, 180, 192, 273
Goupil, 188
Green, C. E., 63, 64, 65, 66, 152, 197, 198, 777
Greene, Charles Lyman, 78
Greenough, Robert B., 215
Greer, W. J., 59
Greischer, S., 658
Grotjahn, Alfred (see Grotjahn and Kaup)
Grotjahn and Kaup, 16
Gryzanovski, E. G. F., 3
Günsburg, B. F., 174

INDEX OF AUTHORS

Haaland, M., 153
Hall, Haviland, 79
v. Hansemann, D., 205
Harben, Henry, 90
Harris, Philander A., 213
Harris, W. H., 188
Härting, F. H., 68
Hartwell, John A., 165
Hatch, J. Leffingwell, 9, 271
Hauser, P., 694
Haviland, Alfred, 104, 105, 191, 199
Hazen, H. H., 215
Heim, Gustav, 73
Heron, David, 57, 184, 189, 190
Hesse, W., 68
Hill, Bertram, 15
Hippocrates, 5, 207
Hirsch, August, 104, 105
Hirschberg, 58
Hislop P. W. (see Hislop and Fenwick)
Hislop and Fenwick, 190, 204-205
Hoeber, W. R., 202
Hoffman, Frederick L., 3, 15, 25, 46, 47, 86, 103, 125, 131, 151, 162, 163, 166, 185, 187, 777
Hollander, Bernard, 208
Horand, M., 189
Horsley, *Sir* Victor, 184
Hrdlicka, Ales, 152
Hunter, Arthur, 360
Hunter, John, 187
Hutchinson, *Sir* Jonathan, 4, 14

Jacobson, J. H., 213
Jaquith, W. A., 86
Jevons, Stanley, 73
Judd, E. S., 164

Kappeler, O., 193
Kaup, J. (see Grotjahn and Kaup)
Keen, W. W., 155
Kelly, Howard A., 194
King, George, 34 (see King and Newsholme)
King and Newsholme, 18, 28, 30, 31, 33, 34, 46, 83, 84, 90, 105, 283
Kirschner, H., 148
Knopfel, L., 149
Kolb, Karl, 76, 644-645

Lakeman, Curtis E., 215
Lambe, Howard, 174
Landis, H. R. M., 188
Laurence, J. Z., 153
Lawes, E. T. H., 50
Lazarus-Barlow, W S., 67, 185-186, 202, 205
Le Conte, John, 7 22, 23
Lenhart, C. H., 181
Leonard, C. L., 67
Leonidis, 5
Leuenberger, S. G., 68
Levin, Isaac, 151, 210
Lex, 160
Leyden, Hans, 693
Lichty, J. A.,194
Lindemann, E., 650-651
Lockwood, C. B., 7, 169
Lombroso, Cesare, 148
Longstaff, G. B., 2, 3, 24, 206
Lyon, Glover, 34
Lyon, I P., 105, 201

MacCarthy, 195
Madden, F. W., 136
Magruder, W. E., 60
Mallory, F. B., 166
Marine, David, 181
Marsden, J. A., 785
Marsh, M. C. (see Gaylord and Marsh)
Martin, 213
Martin, Franklin H., 215
Matas, Rudolph, 128, 132, 531
Maudsley, Henry, 208
Maydl (see Maydl and Nothnagel)
Maydl and Nothnagel, 194
Maynard, G. D., 192
Mayo, C. H., 195
Mayo, W. J., 187, 210
McCarrison, Robert, 180-181
McGraw, T. A., 213
Meech, 357
Meitzen, August, 3
Menard, 66
Mendel. Lafayette B., 176
Mercier, Charles, 208
Meyer, Willy, 207, 214
Michel, 174
Mill, John Stuart, 73
Miller, James, 155, 156
Mitchell, 58
Moinet, F. W., 78
Montgomery, E. E., 169
Moore, C. H., 154
Morison, Rutherford, 189-190
Morris, *Sir* Malcolm, 211
Moullin, C. M., 155, 167
Muirhead, Claud, 84
Murray, J. A., 34, 173
Murray, R. W., 36

Neve, Ernest F., 30
Neves, A., 696
Newsholme, Arthur, 34, 173 (see King and Newsholme)
v. Noorden, Carl, 176, 191
Nothnagel (see Maydl and Nothnagel)

Oertel, H., 4
Ogle, William, 86, 87, 172
Ogston, 58
Oliver, *Sir* Thomas, 49, 59, 64, 66, 198, 201
Orth, J., 160
Osborne, Thomas B., 176
Otto, C., 165

Paget, *Sir* James, 4, 14, 78, 91
Park, Roswell, 41
Parker, Willard, 92

INDEX OF AUTHORS

, C. L., 212
J. F., 34, 84
, John, 6, 21, 73
, Karl, 172
y (see Pembrey and Ritchie)
y and Ritchie, 4, 8, 269
E. B., 4
A. E. H., 210
d, W. W., 68
Paul, 189
nann, Walther, 204
C. A., 66
D'Arcy, 200
g, Fr., 104
n, T. M. (see Delafield and Prudden)
. L. (see Gould and Pyle)

ET, N. A., 3

IATI, A., 183
ini, Bern., 48
sek, J., 58
, M. E., 79
er, J. A. C., 190
udwig, 59
H., 160
., 160
W., 36, 137
180
n, Robert, 41, 183, 184
, H., 205
son, J. H., 34
James, 168 (see Pembrey and chie)
on, W. F. 203
n, W. L., 155, 207, 213
Leonard, 4, 138, 177
S. L., 304
sky, 188
P., 47, 208, 209
D. B., 207
W. F., 179
. C., 69
eyton, 176
, H. W., 3
Rollo, 57, 58, 215

, J. A., 215
, W. L., 23, 24
, 139
. D., 169, 170, 171, 192
G. J., 176
erg, J. F., 54
, Rudolph, 4, 154, 165, 171, 188, , 194
, I., 29
n, Ludwig, 59
amuel, 6
. B., 4
78, 92
g, E. H., 78

Simmonds, M., 44
Slye, Miss Maud, 173
Smith, A. W., 206
Snow, Herbert, 184
Soegaard, Munch, 203
Steinhaus J. 160
Steinhelm, 149
Sweet, J. E., 176
Symonds, Brandreth, 359
Syms, Parker, 155, 156, 157, 214

TANCHOU, M., 23
Tatham, J. F., 34, 49, 86, 87
Taussig, F. J., 214
Teece, Richard, 34
Thackrah, C. T., 48
Theilhaber, A., 658
Theilhaber, Felix, 149, 688
Thompson, W. G., 61
Tyzzer, E. E., 173

VAN DER VELDEN, 176
Van Konijnenburg, J. J., 150
Vaughan, J. W., 207
Velpeau, Alfred, 78
Verworn, Max, 73, 74
Vigouroux, Romain, 190
Virchow, Rudolf, 6, 73, 202, 205

WADE, H., 203
Wainwright, J. M., 165
Walshe, W. H., 6, 7, 29, 266
Ward, 78
Warren, J. M., 6, 7
Watkins-Pitchford, Wilfred, 204
Webb, Law., 199
Weinberg, W., 76, 205
Werner, R., 73, 203-204
Wertheim, Ernst, 210
Weyl, Theodor, 62
White, C. P., 7, 10, 11, 70, 155, 196, 272
White, G. D., 205
White, R. P., 55
Wickham, Louis (see Wickham and Degrais)
Wickham and Degrais, 211
Willcox, W. F., 31, 46, 47, 105
Williams, W. Roger, 11, 14, 15, 41, 55, 56, 57, 60, 90, 105, 136, 150, 154, 165, 174, 175, 177, 185, 188, 190, 192, 193, 206
Williamson, C. S., 170
Winkler, 195
Winter, Georg, 212, 213, 214
Winternitz, M. C., 86
Woglom, W. H., 5
Wolff, Jacob, 6, 16, 26, 54, 62, 97, 128, 140, 148, 174, 179, 187, 188, 189, 190, 195, 198, 213
Wright, E. F., 179

YOUNG, H. H., 215

INDEX OF SUBJECTS

.BDOMEN, cancer of, 147
.bdominal viscera, tumors of, 5
.berdeen, Scotland, 615
.bscesses, mortality from, 37
.ccessible cancers, mortality from, 30, 31, 33, 37, 84
  classification of, 283
.ccidents and cancer, 48, 49, 440-441 (see traumatism and irritation)
.ccuracy of statistics (see statistics)
.ctinic stimulation and cancer, 68, 204
.ctuarial statistics, 35, 83-84
dami, theory of growth of, 202
denoma, 10, 273
dvertisements of alleged cancer cures, 212
frica, 106, 136-137, 219, 702
fricans, cancer among, 36, 137, 704 (see creoles and negroes)
ge, in relation to cancer, 11-14, 24, 34, 85, 88, 89, 93, 94, 102, 109, 111-114, 116-120, 131, 152, 169, 199, 200, 201, 305-401, 418-785
  average, at death, 77, 85, 88, 89, 201
  and cancer increase, 111, 112
  in carcinoma and sarcoma, 14, 131
  and conjugal condition, 100
  distribution, changes in, 39
  incidence, by organs and parts and sex, 113-114, 228-231, 316-785
  of inmates of cancer-houses, 198-199
  international statistics according to, 238-261
  old, extreme, 14, 38, 77, 109, 114, 134, 135, 153, 154, 183, 204
  and sex, effect of, 12, 111-112, 114-115
  specific death rates according to, 436-439
  standardization of rates for, 12, 114
gricultural workers, 57, 58, 62, 72, 74, 75, 204, 306-313, 315
lbuminoid diet and cancer, 174, 175
lcohol and cancer, 57, 116-121, 174, 183, 184, 220
lcohol and cancer of œsophagus, 183
lgeria, cancer mortality of Europeans in, 136, 702
lsace-Lorraine, 650
merica, geographical distribution of cancer in, 106, 740 (see Western Hemisphere)
  cancer in cities of, 145, 225, 473
  mortality statistics of, improvement of, 4, 44
  vital statistics of, 4, 34, 42, 44
merican Gynecological Society, 777
American Medical Association, 215
American Oncologic Hospital, 159
American Society for the Control of Cancer, 777, 779
Amsterdam, Holland, 40, 106, 662-665
Anæmia, clinical significance of, 170, 176-177
Anaplasia, theory of cancer, 205
Angioma, 10, 273
Angola, 706
Aniline-dye workers, 59, 70, 73
Animals, cancer in, 63, 152, 173-174, 181-182, 207
Antagonism, theory of cancer, 188
Anthracene and cancer, 49-51, 61
Anthropometry of cancer patients, 97-98, 356 (see height and weight)
Antiquity of cancer, 5
Antwerp, Belgium, 669
Apoplexy, mortality from, 440-441
Appendicitis and cancer, 36, 117-121, 194-195, 220
  operations for, 195
Arabs, cancer among, 136
Arctic regions, 142 (see latitude)
Argentina, 40, 140-141
Arid regions, cancer in, 192
Armenians, cancer among, 701
Arsenic workers, 56, 70
Arthritism and cancer, 190
Asia, 106, 137, 138, 219, 708
Asiatics, cancer among, 704
Asylums, cancer among inmates of, 58
Athens, Greece, 700
Atra bilis, theory of cancer, 179
Augsburg, Germany, 202
Augusta, Georgia, 128, 475-476
Australasia, 106, 107, 138, 720
Australian Commonwealth, 12, 38, 39, 107, 123, 124, 125, 139, 193, 254-255, 412, 720-722
  mortality from diabetes in, 193
Austria, 38, 40, 107, 134, 135, 679, 680
Autopsy investigation, Johns Hopkins Hospital, 86
Autopsy records, 4, 18, 23, 81, 84, 86, 138, 156, 160, 164, 170, 177, 194, 288-289
Average age (see age)
Ayr, Scotland, 200

BACTERIA and cancer, 198
Baden, 648-649
  cancer census of, 36, 185, 203, 204, 206
Bahia, Brazil, 141, 764-765
Bakers, 48, 306-313

Baltimore, Maryland, 128, 477-479
Barbados, hospital statistics of, 751
Barbers, 314
Barnard Free Skin and Cancer Hospital, 159
Bartenders, 314
Basel, Switzerland, 678
Bashford, cancer classification of, 31
Bavaria, 33, 123, 124, 125, 136, 219, 246-247, 412, 643-646
Belfast, Ireland, 625
Belgium, 134, 667-668
Bell, on ulcers, 6
Bellevue Hospital, 20
Bello Horizonte, Brazil, 767
Bengal, India, 709
Benign tumors (see tumors)
Berbers, cancer among, 136
Bergen, Norway, 634
Berlin, Germany, 653-654
Bermuda, 139-141, 747
Bern, Switzerland, 678
Bertillon classification of deaths from cancer and other tumors, 73, 276-282
Betel-nut chewing and cancer, 15, 30, 122, 138, 147
Bile and cancer, 179
Biliary calculi, 38, 110, 281, 430
Biochemical aspects of cancer, 179, 197
Biological aspects of cancer 4, 6, 9, 198, 203
Birmingham, England, 610
Blacksmiths, 57, 313, 316
Bladder, cancer of, 59, 70, 116, 120
Blast-furnace workers, 61
Blastomycetes in plants, 198, 207
Blood, changes of, 176
Blood disease, cancer not a, 171
Boatmen, 314
Bogotá, Colombia, 760
Bohemians, cancer among, 680
Bolivia, 140-141
Bookbinders, 313
Bordeaux, France, 672
Boston, Massachusetts, 39, 128, 129, 130, 479-483
  early cancer records of, 7
Boxmakers, 313
Bradshaw Lectures, 184
Brazil, 39, 139-141
Breast, cancer of, 5, 7, 37, 58, 68, 77, 100, 110, 114, 115, 116, 120, 122-125, 130, 139, 168, 179, 191, 210, 229, 231, 300-301, 316-775
  average age at death, 169
  in Ceylon, 138
  and conjugal condition, 98, 99, 100
  diagnosis of, 5, 6, 111, 158
  duration of, 165-166
  hospital experience of, 159, 163
  among Japanese women, 125, 220
  among Jewesses, 148, 149
  recurrence in, 165
Bremen, Germany, 652
Brewers, 57, 64, 72, 73, 306-313 (see maltsters)
Briquette manufacture, 61
Bristol, England, 611
British Columbia, 39, 745
British Guiana, 140-141, 752-753
British Honduras, 140-141, 751
British possessions, 42
British West Indies, 140-141
Brompton Free Cancer Hospital, 159
Brookfield Township, New York, 105, 201-202
Brooklyn, New York, 128, 484-485
Brussels, Belgium, 160, 669
Buccal cavity, cancer of, 77, 110, 111, 113, 114, 115, 130, 132, 139, 158, 163, 298-299, 316-775
  model inquiry blank for, 298-299
  and smoking, 185-186
Budapest, Hungary, 148-150, 686-688
Buenos Aires, Argentina, 141, 767-770
Buffalo, New York, 128, 484
Build and cancer, 97-98 (see anthropometry, height and weight)
Builders and contractors, 313
Burghers in Ceylon, cancer among, 710
Butchers, 57, 71, 75, 306-315

Cachexia, clinical significance of, 45, 170
Calculi of urinary tract, 38, 281, 430
Calcutta, India, 137-138, 708
  autopsy records of, 177
California, 108, 422
Campaign against cancer (see American Society for Control of Cancer and education)
Canada, 140
Cancer à deux, 195, 205-206
Cancer, age in relation to (see age)
  antiquity of, 5
  areas, 199, 201, 202, 204, 220
  blanks, model, 284-304
  cages, 200
  carriers, 205
  census, 35, 36
  classification (see classification)
  comparative mortality from other causes and, 440-441
  conjugal condition as a factor in, 97-101, 205, 219, 603, 604 (see marital infection)
  cures, alleged, 212
  deaths, transfer of, 113
  definition of, 4, 7, 18, 30, 155
  and diabetes, 192
  diagnosis, difficulties of, 5
  duration of (see duration)
  education, 777-783
  families, 202-204
  fear, 208
  hospital statistics, 158-161
  houses, 196, 198-201, 220

:ancer (*continued*)
importance to insurance companies of, 77-103
increase of, details by organs and parts, age, and sex, 38 (see increase and mortality)
Kangri, of Kashmir (see Kangri)
latitude as a factor in (see latitude)
mortality, earliest statistics of, 23
occupational incidence of (see occupation)
patients, physical condition of, 153-155 (see anthropometry, height and weight records, model forms for)
race as a factor in (see race)
records, inquiry blanks and forms, 284-304
rooms, 198
sex as a factor in (see sex)
streets, 197-202
terminology, difficulties of, 4
and tuberculosis (see tuberculosis)
varieties of, 167 (see definition and classification)
villages, 197, 199-204, 220
:anvassers and collectors, 314
:ape Colony, 136, 704
'ape Verde Islands, 706
:arcinoma, definition of, 5, 9, 10, 14, 34, 273 (see classification)
and sarcoma, mortality from, 167
:arcinomata, duration of, 167
subclassification of, 11
:arpenters and joiners, 306-313, 315
:ausation, 30, 72, 73, 74, 116-121, 141, 168-169, 220 (see irritation and parasitic theory)
:auses of death, contributory in cancer patients, 44-45, 164
:ellular pathology, 4, 6, 184 (see Cohnheim's theory)
:elsus, knowledge of cancer of, 5
:ensus, cancer, 35
observations on, 74, 75, 76, 185, 186
Baden, 36, 203, 204, 206
Germany, 40, 74-75
Holland, 40
Hungary, 71, 206, 315
Sweden, 76
:ensus, letter from director of, 304
'entenarians, 14 (see old age)
'ertificate of death, standardized, 285
'ervical erosion and cancer, 157
'ervix, cancer of, 99
'estodes, 205
'eylon, 15, 137, 138, 147, 709-711
cancer of breast in, 138
hance occurrence of cancer, 206
hannel Islands, 134, 135, 627
harity Hospital, New Orleans, 132, 158, 159, 526-531
Charleston, South Carolina, 16, 128, 129, 487-489
Charts, cancer mortality, 224-265
Age and organs and parts, United States Registration Area, 230
Australia, 254
Bavaria, 246
Cities, comparative, American and foreign, 226
England and Wales, 240
Fatality rate, Johns Hopkins Hospital, 264
Holland, 244
International statistics, 224, 228
Ireland, 242
Italy, 250
Japan, 252
London, 260
New York City, 258
Organs and parts, international statistics, 228
Prudential Industrial experience, 262
Race, eight Southern cities, U. S., 234
Race, Maryland, 236
Sex and age, United States Registration States, 232
Switzerland, 248
United States, Registration Area, 230, 232, 238
Uruguay, 256
Chauffeurs, 314
Cheek, cancer of, 15, 30, 122, 147 (see buccal cavity, Kangri cancer)
Chemical industries, 58, 62, 65, 66
Chicago, Illinois, 128, 490-492
Childbirth and cancer, 116-121, 135
Childhood, cancer in, 183
Chile, 140-141, 772
Chimney-sweeps' cancer, 49-51, 56, 57, 58, 59, 60, 61, 62, 63, 64, 69, 70, 72, 73, 122, 147, 175, 176, 306-312
China, 178, 714-715
Chinese, cancer among, 36, 138, 139, 178, 714-715, 719
Chloroma, 273
Cholesteatoma, 273
Chondroma, definition of, 9, 10, 273
Christiania, Norway, 633
Christians and Jews, cancer among, 650, 658 (see Jews)
Chronic irritation and cancer, 183-187 (see irritation, alcoholism, smoking, etc.)
Chronometry of life, 14
Cider-drinking and cancer, 58, 174
Cigarmakers, 57 (see tobacconists)
Cincinnati, Ohio, 128, 492-493
Cirrhosis, hepatic, 183
Cities, cancer in, 126-129, 144-145, 227, 402-775
cancer mortality in, by size, 144
increase in cancer mortality of, 127-128

Civilization and cancer, 23, 122, 146, 147, 178
Civilized world, mortality in, 38, 39-41, 221
Classification, Bertillon, international, of tumors and diseases allied to tumors, 276-282
  International, of causes of death, 31
  of plant parasites, 198
  of tumors, 8, 9, 10, 11, 22, 167, 268-283
Classification of cancer, 7-11, 18-20, 22-23, 25, 31, 105, 155, 161, 167, 268-283
  changes in, 37
  clinical and anatomical, 155, 166, 167
  Delafield, 8
  Delafield and Prudden, 9, 10
  Gould and Pyle, 273-275
  Hatch, 9, 271
  Imperial Cancer Research Fund, 283
  Pembrey and Ritchie, 8-9, 269-270
  Walshe, 7, 268
  White, 10-11, 272
Clay-pipe smoking and cancer, 59, 185
Clergymen, 71, 72, 306-312, 314
Clerks, bookkeepers, etc., 314
Cleveland, Ohio, 128, 494-496
Climate, 143, 152, 204
Clinical diagnosis, 169-170
  records of, value of, 171 (see classification, clinical)
Coachmen, 57
  and chauffeurs, 314
Coal-dealers, 72, 306-312, 314
Coal-heavers, 57
Coal-miners, 57, 306-313
Coal-soot (see soot and chimney-sweeps' cancer)
Coal-tar industry (see tar and paraffin industry)
Cobalt-mine workers, 70
Coexisting diseases (see coincident diseases)
Coffee-drinking and cancer, 178
Cohnheim, cancer theory of, 6, 60, 202
Coincidence, significance of, 171, 191, 199, 201, 204-206
Coincident diseases, 187-188, 220 (see diabetes, syphilis, tuberculosis, etc.)
Collective phenomena (see law of large numbers)
Colloid cancer, definition of, 8
  classification of, 268, 273
Cologne, Germany, 656
Colombia, United States of, 140
Colorado, 108, 422
Columbus, Ohio, 128, 496
Commerce (employers and employees), 315
Commercial travelers, 57
Common laborers, 315
Commonwealth of Australia (see Australian Commonwealth)
Communicability of malignant disease, 206 (see infection)
Comparative mortality, American and foreign cities, 145, 226
  international, 413-417
  by race, 234
  Western Hemisphere, 139-141
Complications in cancer, 44-46
Conclusions, restatement of, 218-221
Conditioning circumstances (see causation)
Conjugal cancer, 203, 207
Conjual condition and cancer, 97-101, 205, 220, 603-604 (see marital infection, cancer of ovaries, cancer of breast and cancer of uterus)
Connecticut, 108, 113, 422, 455-457
Connective-tissue congestion and cancer, 183
Connective-tissue tumors, 10 (see sarcoma)
Consanguinity and cancer, 201-204
Constantinople, Turkey, 701
Contact infection, 202-207
Contagion (see infection and parasitic theory)
Continental United States (see United States)
Contributory causes, 44, 45, 46, 168-169 (see causation)
Control, cancer, problem of, 103, 171, 215-217, 777-786
Controversies, useless statistical, 43-44
Copenhagen, Denmark, 639
Cooks, 314
Coopers, 313
Copts, cancer among, 136
Corea, 178
Corner houses and cancer, 197
Corrected death rates (see standardized death rates)
Costa Rica, 140-141, 759
Creoles in Sierra Leone, cancer among, 36, 137 (see negroes)
Croatians, cancer among, 686
Crocker, George, Special Research Fund, 151, 178, 182
  model cancer blank of, 294
Crude death rates (see standardized death rates)
Cuba, 39, 123, 124, 125, 140-141, 413, 754, 756
Cysts and other tumors of the ovary, 282
Cytomata, definition of, 10
  classification of, 272

Dampness and cancer, 190-191, 197, 198, 199, 203
Danish cities (see Denmark)
Danish West Indies, 140-141
Dayton, Ohio, 128, 497-499
Death certification, 2-5, 23, 27, 32, 82-84
Death rates, variations in, 1, 7, 12, 13, 18, 25, 30, 39, 40, 46, 47, 77-78, 128
  cancer, maximum, 46
  crude (see crude death rates)
  European countries, 46, 47

Death rates, (*continued*)
general, decline in, 17 (see mortality)
standardized (see standardized death rates)
Debility, clinical significance of, 169-170
Decrease in cancer, 40, 94, 216
Decrease in chimney-sweeps' cancer, 49
Definition, cancer, difficulty of, 4
adenoma, 10
angioma, 10
carcinoma, 10, 34, 167
chondroma, 10
endothelioma, 10
fibroma, 10
glioma, 10
leiomyoma, 10
lipoma, 10
lymph-angioma, 10
myxoma, 10
osteoma, 10
rhabdomyoma, 10
sarcoma, 10, 34, 167 (see classification)
Delafield and Prudden, tumor classification of, 9-10
Denmark, cities of, 40, 134, 637-638
Denver, Colorado, 128, 500-501
Dermatitis, Roentgen-ray (see X-ray dermatitis)
Dermoid cyst, 275
Detroit, Michigan, 128, 501
Development and growth (see growth and development)
Diabetes and cancer, 45, 119, 187, 192-194, 220
Diagnosis, cancer, 4, 6, 78, 81, 169-170
differential, 22
difficulties of, 4, 5, 11, 103, 157-158
early, importance of, 42, 154, 171
erroneous, 21, 37-38, 123-125
and increase of cancer, 18, 23, 24, 25, 28, 37, 38
microscopical, 288-289
terminal, 6, 22, 34
Diet and cancer, 138, 174-179, 182, 220
Diet and retarded growth, 176
Digestion and cancer, 176
Digestive diseases, mortality from, 440-441
Digestive organs, cancer of, 32, 33
Discharges, clinical significance of, 169-170
Disease classification, 20 (see classification)
District of Columbia, U. S. A., 108, 128, 573-581
cancer in, by conjugal condition, 98
cancer in, by race, 15, 16, 131
Domestic servants, 56, 75, 306-312, 315
Drainage and cancer, 203 (see dampness)
Drapers, 57
Draymen, teamsters and drivers, 314
Dresden, Germany, cancer exhibit of, 106, 659
Drinking habits and cancer (see alcoholism)
Drinking water and cancer, 172
Dublin, Ireland, 624
Duodenum, cancer of, 176
Duration, of cancer, 59, 60, 115, 116, 165, 166, 168, 220, 623
of insurance and cancer, 83, 91, 96, 97, 166
of life, effect of, 23
Dutch East Indies, 713
Dutch Guiana, 140-141

Early observations on cancer, 78
Early symptoms, importance of, 209 (see diagnosis)
Eastern Hemisphere, cancer mortality of, 143-144
East Indians, cancer among, 136, 138, 140, 705, 738
East Prussia, cancer campaign in, 213 (see Winter, Georg)
Economic condition and cancer, 152 (see poverty and wealth and well-to-do)
Ecuador, 140-141
Eczematous ulcerations and cancer, 52-54 (see tar and pitch industry)
Edinburgh, Scotland, 122, 616-617
Editors and journalists, 314
Education and publicity and cancer, 171, 208-209, 212-217, 777-785
Educational campaign against cancer, 209-217
Educational pamphlets, 215
Egypt, 136, 178
Egyptians, cancer among, 15, 136
Electrical workers, 313
Elevator-tenders, 314
Emaciation, clinical significance of, 169-170
Embryonic rests, theory of cancer, 202, 205
Encephaloid, classification of, 268, 273, 276
Endothelioma, 10, 273
Engineers, 72, 313
England and Wales, 13, 23-24, 30, 38-40, 42-43, 70-72, 107, 123-125, 134, 135, 167, 179, 191-193, 240-241, 306-312, 414, 596-604
accessible and inaccessible cancers in, 33-37
cancer and gout in, 191
cities of, 226-227
increase of cancer in, 33, 84-90, 193
mortality from appendicitis in, 194
mortality from diabetes in, 193,
mortality from sarcoma in, 167
occupational mortality in, 306-312
standardized death rates of, 310-312
Environment and cancer 122, 197, 203-204
Epiblast tumors, 269, 271
Epithelial-tissue type, 10
Epithelioma, definition of, 8-9, 10, 274
Erfurt, Germany, 63
Errors in diagnosis and statistics, 1, 21, 129, 200 (see autopsy records)
Errors of development, tumors arising from, 270

INDEX OF SUBJECTS

Esquimos, cancer among, 147
Essen a/R., Germany, 657
Ethnological distribution, 36, 128 (see race)
Europe, countries of, 46, 106, 133-136, 219, 594-595
cities of, 145
Europeans, cancer of, in Africa, 704-705
in Ceylon, 15, 710
in Dutch East Indies, 713
in Fiji, 738
in Hongkong, 714
in India, 177
in Manila, 719
Exophthalmic goitre (see goitre)
Experiments, cancer, on animals, 173, 176
External cancers, increase in, 31, 86, 87, 89, 177, 203
origin of, 203
External and internal cancers (see internal cancers, also accessible and inaccessible)
Extrinsic origin of cancer, 197, 206 (see environment and irritation)

FALLACIES, statistical, 2, 3, 22, 23, 41, 43, 162, 203, 209
Family history of cancer, 91-92, 95, 97, 116, 152, 171-173, 200, 204, 220 (see heredity)
records of, value of, 172
Farmers, 57 (see agricultural workers)
Farmhouses, cancer in, 188-189, 198, 203
Fatality rate, 158, 159, 163, 264-265
Female generative organs, cancer of (see generative organs)
Females, cancer mortality of, 12, 13, 42, 110, 112
in insurance experience, 96-98 (see males and sex)
Fertilizers and cancer, 64
Floods and cancer, 105, 190-191
Florence, Italy, 692
Fibro-adenoma, varieties of, 5
Fibroma, definition of, 9, 10, 274
Fiji, hospital statistics of, 737-738
Fijians, cancer among, 737-738
Filipinos, cancer among, 719
Finland, 640-641
and Sweden, 641
Firemen, 313
First-born, cancer among, 154
Fish diet and cancer, 174
Fish, endemic goitre in, 180-182
thyroid carcinoma of, 180-182
Fishermen, 57, 71, 306-313
Fishmongers, 57
Food and cancer (see diet and nutrition)
Food disease, cancer a, 183
Foreign countries, 133-145, 403-417, 582-775
Foremen, 313
Forfar, Scotland, 197
Forms of cancer, international classification of, 276-280
France, 39, 40, 106, 134-136, 670
League against cancer, 213
Frankfurt a/M., Germany, 30, 31, 32, 33, 105, 654-656
cancer classification of, 31
Free Cancer Hospital, Brompton, 159
Freetown, Sierra Leone, 136, 137, 706
French cities, 226 (see France)
Fuel briquettes, manufacture of, 51-54, 69
Fukien, China, hospital statistics of, 715
Furriers, 65

GALEN, cancer theory of, 5, 6
Gall-bladder, cancer of, 117, 120, 156, 176, 187
Gall-stones and cancer, 156, 185, 186-187, 219
Galton Laboratory, 57
Gardeners, 49, 62, 72
Gas industry (see tar and paraffin workers, also patent-fuel industry)
Gastric cancer, 176 (see stomach and liver)
blank, 302-303
and ulcer, 110, 117, 156, 187
Gastric disturbances, significance of, 176
Gas-workers, 57, 71, 72, 306-312
General Memorial Hospital, 159, 296-303
Generative organs, female, cancer of, 16, 32, 33, 77, 99, 100, 110-111, 113-115, 116-121, 122-125, 130, 135, 139, 158, 160, 163, 316-775
by conjugal condition, 98
estimated mortality in the United States from, 77
international comparison, 228
Generative organs, male, cancer of, 177
Geneva, Switzerland, 678
Genito-urinary organs, cancer of, 215
Genoa, Italy, 691
Geographical pathology, 11, 26, 104, 105, 122-125, 219, 220
Geologic conditions and cancer, 203, 204
Germans, cancer among, 680, 686
Germany, 33, 40, 58, 76, 134, 135, 642
cancer census of, 74-76
cities of, 226
insurance experience of, 33
society for cancer research of, 6, 41, 62
Gibraltar, 135, 628
Gilgit, India, goitre in, 180-181
Glasgow, Scotland, 617
Glass-workers, 306-313
Glioma, 10, 274
Goitre, definition and etiology of, 181
Commission, Swiss, 180
in fish (see thyroid carcinoma)
Göteborg, Sweden, 637
Gould and Pyle, tumor classification of, 11, 180, 273-275
Gout and cancer, 187, 191-192, 219
mortality from, 191

ıufacture, 52
w York (see New York)
ı, 699
ıcer among, 701
, 57, 306-312, 314
d development, disorders of, 4,
ı3, 155, 166-170, 202, 220, 270
kers, 65
Ecuador, 760
ncer among, 152

ıE, Holland, 665-666
Germany, 651
st, Norway, 142, 634
akers, 313
Connecticut, 128, 502-503
cer classification of, 271
6-313
uba, 756
nce, 673
3, 139, 739
of breast in Japanese women
ı, 125
, cancer among, 739
cancer patients 152 (see physical
ındition)
ıcation League, 215-216
ıses, mortality from, 440-441
, Germany, 160
l cancer, 97, 98, 203
, 650-651
f cancer, 78, 79, 89, 90, 91-92, 95,
7, 116, 152, 171-173, 200-201, 220
ee family history)
l cancer, 117
many, 149, 650
ıncer among, 399
s, knowledge of cancer of, 5
ı, classification of, 272
ic principle of classification, 9
cancer, 5, 6, 11
New Jersey, 128, 504
), 134, 135, 219, 244-245, 661-662
census of, 40
among Jews in, 150
in, by organs and parts, 123-125
China, 137, 138, 714
xperience data (see American
ncologic, Barnard Free Skin and
ancer, Charity, Collis P. Hunt-
ıgton, Free Cancer, General
lemorial, Johns Hopkins, London,
lassachusetts General, Middle-
x, etc.)
cords, 158-161, 220
atistics, importance of, 160-161,
21
ıd stablemen, 314
onditions and cancer, 122, 204
ee cancer-houses)
ınd cancer, 191, 192 (see climate)
39, 47, 107, 134, 135, 136, 638-686
census of, 36, 71, 206, 314

Huntington, Collis P., Memorial Hospital, 161
Husband and wife, cancer among, 202, 205, 206, 207 (see conjugal condition and marital infection)
Hydatid tumors of liver, 281, 428-429
Hydrochloric acid, significance of, 176
Hypernutrition and cancer, 154 (see over-nutrition, diet and weight)
Hyphomycetes in plants, 198
Hypoblast tumors, 269, 271

ICELAND, cancer census of, 640
Ignorance, menace of, 47
Ill-defined cancers (other organs and parts), 77, 110-111, 115, 130, 139
Immunity, surgical, to infection, 207
Imperial Cancer Research Fund, cancer classification of, 283
- on cancer-houses, 198-199
- on cancer increase, 17-18, 31, 34, 135, 138, 161
- on collection of statistics, 138

Inaccessible cancers, 30-31, 84, 86 (see internal and accessible, also external)
Increase in cancer, 7, 11, 12, 13, 15, 16, 17, 18, 23, 24, 25, 26, 27, 28-47, 78, 82, 85, 86, 87, 89, 90, 105, 133, 134, 141, 145, 160, 203, 218, 220, 305-775
- by age and sex, 111, 112, 305-775
- in American cities, 127, 128, 450-581
- in Australia, 193
- of breast, 113-114, 447
- of buccal cavity, 113-114, 444
- by conjugal condition, 98-101
- in European countries, 46, 47, 191-192, 193, 594
- of generative organs, female, 113-114, 447
- of ill-defined or not specified organs, 113-114, 449
- insurance experience of, 81, 82, 84, 85, 86, 93, 94
- of internal and external organs, 87, 111, 113, 114, 219
- international statistics of, 224-265, 305-775
- in New England States, New York, New Jersey, 127
- by organs and parts, according to age and sex, United States, 113-114, 443-449
- by organs and parts, England and Wales, 598-600
- of other or not specified organs, 113-114, 449
- of peritoneum, intestines and rectum, 113-114, 446
- by race, 128, 137
- of skin, 113-114, 448
- of stomach and liver, 113-114, 445
- in United States, 28-47, 77-78, 111, 112, 113-114, 127-128, 146

India, 137, 138, 177
  cancer of cheek among natives of, 122 (see betel-nut chewing and Kangri cancer)
  cancer among natives of, 138
Indiana, 108, 423
Indianapolis, Indiana, 128, 505
Indians, North American, cancer among, 15, 147, 151-152, 178, 219
Indigestion and cancer, 170
Industrial disease, cancer as an, 48-76
Industrial insurance experience, Prudential, of America, 45, 101-102, 313-314 (see insurance companies and Prudential)
Inebriate asylums, cancer in, 184
Inebriety and cancer, 57, 184, 189 (see alcoholism)
Infection in goitre, 181
Infectious, cancer not, 192, 206 (see parasitic theory)
Infectiousness of cancer, 192, 199, 203, 205, 207, 220
Inheritance of cancer (see heredity and family history)
Injuries and cancer (see accidents and traumatism)
Innkeepers, 306-315
Innocency and malignancy, 8 (see tumors, benign)
Innocent tumors, classification of, 270
Inoperable cancer, 165, 209
Inquiry blanks, cancer, 27
Insanity and cancer, 55, 58, 208-209, 220 (see worry)
Institutional treatment, 209
Institutions, cancer deaths in, 127, 129
Insurance agents, 314
Insurance companies, cancer mortality experience of, American and foreign, 316-401
  Ætna, 358
  Alte Leipziger, 94
  American, 95-98, 356, 357
  Anker (Vienna), 392
  Assicurazioni Generali, 94, 392-393
  Australian Mutual Provident, 398
  Austrian, 390-392
  Austro-Hungarian, 94-95
  Basle Life, 396
  British Empire Mutual, 83, 363-364
  British and German companies, 376
  Clergy Mutual, 92, 364-365
  Deutsche (Lübeck), 382
  Deutsche (Potsdam), 377
  Deutscher Kriegerbund, 377
  Donau (Vienna), 393
  Dutch East Indian, 399
  Equitable Society (London), 365
  First General Association Austro-Hungarian officials, 393
  Foncière (Budapest), 94, 396
  Foreign, 361-363
  Freia, Bremen-Hannoversche Lebensversicherungs-Bank, 377
  Friedrich Wilhelm, 378-381
  German (combined), 376
  Germania, Germany, 94, 382
  Gotha, 33, 83, 383-385
  Gresham Life, 92, 366
  Janus, Mutual Life, 393
  Japanese, 401
  Karlsruhe, 385-387
  La Suisse (Lausanne), 396
  Leipzig, 387-388
  Magdeburg, 388
  Margraviate Moravia (Brünn), 394
  Meiji Life (Japan), 137, 399-400
  Metropolitan (London), 82, 366
  Mutual Life (Krakau), 394
  Mutual Life (New York), 90, 91, 92, 93, 192, 359-360
  New York Life, 360
  Northwestern Mutual Life, 93, 94, 361
  Oriental Government Security Life, 177, 399
  Phœnix (Austrian), 94, 394
  Praha, Mutual Life, 395
  Prudential (America), 45, 70, 72, 101-103, 131, 153, 166, 262-263, 312-314, 321-355
  Prudential (London), 90, 367-369
  Riunione Adriatica Sicurta, 94, 395
  Saxon Military Life, 389
  Scottish Amicable Life, 80, 370-371
  Scottish Union and National, 372
  Scottish Widows' Fund, 78, 80, 82, 83, 84, 85-89, 372-376
  Standard Life (Edinburgh), 80-82
  Stuttgart Life, 389
  Teutonia, 389
  Thule, 397
  Universale, Industrial, 396
  Victoria Life, 390
  Washington Life, 91, 361
Insurance medicine and cancer, 77-103, 214, 218, 316-401
Intermediate type of cancer, 283
Internal cancers, 5, 28, 29, 31, 86, 87, 89, 177 (see accessible, inaccessible and external)
International cancer question form, 291-292
International Conference, 213
International statistics, 16, 106-108, 141-145, 219, 224-265, 305-775
Intestinal cancer, diagnosis of, 158 (see peritoneum, intestines and rectum)
Intestines, cancer of, 117, 121
Invalidity, cancer as cause of, 48
Involvement, cancer and, 120, 121
Ireland, 12, 39, 107, 134-135, 136, 167, 242-243, 414, 618-624
Ironmongers, 306-312
Iron-moulders, 313
Iron and steel workers, 313
Irritability, theory of cancer, 73, 74

Irritation and cancer, 48-76, 156, 183-187, 202, 782-783 (see accidents and traumatism)
Isle of Guernsey, 134, 135
Isle of Man, 135, 626-627
Italians, cancer among, 680
Italy, 39, 134, 135, 136, 250-251, 416, 688-690
    cities of, 226-228

JAMAICA, 40, 748-749
Janitors, 314
Japan, 39, 137, 138, 139, 178, 179, 252-253, 415, 715-717
    cancer in, by organs and parts, 123-125
Japanese hospital experience, 139
Japanese insurance experience, 137
Japanese women, scarcity of cancer of breast among, 125, 219
Jaw, cancer of, 117
Jersey City, New Jersey, 128, 205, 506-507
Jewelers, 313
Jews, cancer among, 29, 31, 40, 147-151, 193, 650, 658, 682-683, 688, 701
    diabetes among, 192-193
Jews and non-Jews, cancer among, 40, 148, 650, 658, 688
Johannesburg, South Africa, 136, 704
Johns Hopkins Hospital, statistics of, 158, 159, 161-163, 264-265
    autopsy records of, 86
Journalists, 72

KANGRI cancer of Kashmir, 30, 122, 147, 174, 175
Kansas City, Missouri, 128, 507
Kentucky, 108, 423
Kidneys, cancer of, 117 (see urinary organs)
Kirkintilloch, Scotland, 197
Kolozsvar, Hungary, 160
Königsberg, Germany, 660
Kristiania, Norway, 633
Kyoto, Japan, 719

LABORERS, 57, 74, 75, 313 (see common laborers)
Labrador and Newfoundland (see Newfoundland and Esquimos)
Lahore, India, Mayo Hospital, 177
Laity, cooperation of in cancer control, 214
Lampblack-workers, 59 (see soot-workers)
La Paz, Bolivia, 760
Latitude and cancer, 142-144, 219, 403-409 (see climate)
Laundry-workers, 72, 75, 313
Law of large numbers, statistical, 3, 41, 142, 145, 218
Lawyers, 306-312
Lead-poisoning, 117
Lead-workers, 65
Leather-workers, 62
Leeds, England, 611
Le Hâvre, France, 673
Leipzig, Germany, 659
Leipzig Communal Sick Fund, 73, 75
Leonidis, cancer theory of, 5
Leprosy and cancer, 187, 199, 219
Liege, Belgium, 668
Life insurance and cancer (see insurance)
Light exposure and cancer, 68 (see actinic stimulation)
Lille, France, 673
Lima, Peru, 141, 761
Limestone formation and goitre, 180
Lip, cancer of, 56, 117, 135, 158, 184, 185-186, 210 (see buccal cavity)
Lipoma, definition of, 9, 10, 274
Liquor-dealers, 314
Lisbon, Portugal, 697
Literature of cancer statistics, 2
Liver, cancer of, 117, 120, 121 (see stomach and liver)
Liver diseases, 37
Liver, stomach and œsophagus, cancer of, 122-125 (see stomach and liver)
Liverpool, England, 608-609
Local cancer studies, 204
Local incidence and variations, cancer, 11, 30, 104-105, 108-109, 204-205
London, England, 23, 29, 260-261, 604-606
London Hospital, 150
London Radium Institute, 210, 211, 212, 221
London Society, early, for investigating cancer, 213
Longitude and cancer, 143 (see latitude and climate)
Longshoremen and stevedores, 314
Los Angeles, California, 128, 508
Louisville, Kentucky, 128, 508
Low-lying districts and cancer, 191 (see swamps)
Luckau, Germany, 197
Luetic antecedents and cancer, 190 (see syphilis)
Lunatic asylums, cancer in, 161-162
Lunatics, cancer among (see insane)
Lung tumors, 173
Lungs, cancer of, 61, 68, 118, 121
Lymph-angioma, 10, 274
Lympho-sarcoma, 274
Lyons, France, 672

MACAO, China, 707
Machinists, 62, 313
Madison County, New York, cancer area, 201-202
Madrid, Spain, 694
Magyars, cancer among, 680, 686
Mail-carriers, 314
Maine, 108, 422, 458-459
Malaria and cancer, 187, 204, 205
Malays, cancer among, 15, 710
Males, cancer among, 12, 13, 42, 97, 316-775

Males and females, cancer among, 316-775
Malignancy, degree of, 48, 166-167, 169, 220
  indications of, 167
Malignant disease (see cancer)
Malnutrition and cancer, 174, 176, 191-192 (see diet, gout, overnutrition and weight)
Malta and Gozo, 628-629
Maltsters, 57, 72, 73, 306-314 (see brewers)
Mammary cancer blank, 300-301
Man and animals, cancer in, 173-174 (see animals)
Manchester, England, 612-613
Manhattan-Bronx, N. Y., 128 (see New York City)
Manila, Philippine Islands, 137, 138, 719
Marble and stone workers, 313
Marital infection in cancer, 98, 205-206, 219 (see conjugal condition and *cancer à deux*)
Marital infection in tuberculosis, 206
Maryland, 108, 423
  cancer in, by race, 236-237
Masons, 313, 315
Massachusetts, 39, 41, 108, 113, 423, 460-462
Massachusetts General Hospital, 20, 129, 164
Mauritius, 136, 703
Maximum cancer death rate, 134, 141
Mayo Clinic, statistics of, 110, 156, 164
Mayo Hospital, Lahore, 177
Meat-eating and cancer, 175, 178 (see diet and vegetarianism)
Mechanical irritation, theory of cancer, 205 (see traumatism)
Medical aspects of cancer problem, 1, 24, 89, 90
Medical selection, value of, 77, 95-97, 101, 103, 219
Medicine, progress of, 6
Medico-Actuarial Investigation, 95-98, 219, 220, 356
Medico-legal aspects, 49
Mellon Institute, smoke investigations of, 64
Memphis, Tennessee, 128, 509-510
Menace of cancer, 42, 47, 131, 141-142, 146, 162-163, 218
Mental condition and cancer, 152, 207-208
Mesoblast tumors, 269, 271
Metabolic disorders and cancer, 132, 156, 174-178, 180, 182, 220 (see diet, overnutrition and weight)
Metal-workers, 62, 74, 75, 306-312
Mexico, 105, 140-141
Mexico, City of, Mexico, 758-759
Mice, cancer heredity in, 173-174
Michigan, 108, 424
  cancer census of, 35
Micro-organisms and cancer, 187-188
Micro-organisms and goitre, 180-182
Microscopical examinations, 8, 18, 34, 84, 288-289 (see autopsy)
Middlesex Hospital, 92, 206
Milan, Italy, 692
Mill operatives, 313
Millers, 71, 306-314
Milwaukee, Wisconsin, 128, 510-511
Miners, 56, 61, 62, 68, 69, 70, 75, 315
Minneapolis, Minnesota, 128, 512-513
Minnesota, 108, 424
Missouri, 108, 424
Mobile, Alabama, 16
Mohammedans, cancer among, 177, 701
Moles, malignant, 155, 157, 187
Molokai Leper Settlement, 187
Montana, 108, 424
Montevideo, Uruguay, 141, 775
Monthly cancer death rate in New York, Massachusetts, New Hampshire and Connecticut, 113, 441
Montreal, Canada, 743
Moors, cancer among, 15
  in Ceylon, cancer among, 710
Mortality from cancer and all forms of malignant and non-malignant neoplasms, 224-265, 305-775 (see autopsy records, statistics, and indexed entries for all civilized countries and their minor civil divisions, by age, conjugal condition, latitude, occupation, organs and parts, race, religion, sex, etc.)
Mortality from cancer, estimate of, 47, 77, 146, 427, 435
Mortality charts, 224-265
Mosambique, Africa, 707
Moscow, Russia, 697
Mountain districts, cancer in, 105
Mouth, cancer of, 118, 120, 121 (see buccal cavity)
Mulattoes, cancer among, 706-707 (see negroes and creoles)
Multiple cancer cases, 200, 202
Munich, Germany, 136, 160, 657
  cancer of Jews in, 148-149
Muscle-tissue type of cancer, 10
Musicians, 314
Myoma, definition of, 9, 274
Myxoma, definition of, 9, 10, 275

NANCY, France, 673
Naphtha industry, 58
Naples, Italy, 691
Nashville, Tennessee, 128
Natal, South Africa, 136, 705
Native races, cancer among (see race and primitive races)
Natural history of cancer (see history)
Neck, cancer of, 118
Negroes, cancer among, 15, 128, 129, 131, 132, 140, 147, 159, 185, 431, 706-707 (see Africans and creoles)
  Africans, cancer among, 704
Neoplasms, 187 (see cancer)
Nephritis, mortality from, 440-441

tissue type of cancer, 10
·lands, 107
na, 275
k, New Jersey, 128, 517-518
England States, New York and New Jersey, 472
undland and Labrador, 140-141, 746
lampshire, 108, 109, 423, 463-464
ncer mortality in, by season, 113
laven, Connecticut, 128, 518-520
ersey, 108, 425, 465
ersey, New York and New England States, 472
rleans, Louisiana, 16, 128, 521-531
Orleans Charity Hospital, 132, 158, 159, 526-531
outh Wales, 138, 723-725
'ork City, 128, 258-259, 532-542
York, New Jersey and New England States, 472
York Pathological Institute (see New York State Institute for Study of Malignant Disease)
'ork State, 108, 425, 466
ncer mortality in, by season, 113
York State Department of Health cancer blank, 290-291
York State Institute for Study of Malignant Disease, 114-121
odel blank, 121
Zealand, 40, 107, 138, 204-205, 736-737
igua, 140-141, 759
France, 672
-mine workers, 70
nalignant neoplasms, classification of, 279-280
urgical treatment, 209
American Indians, cancer among (see Indians)
Carolina, 425
ern Territory, Australia, 138, 735
y, 40, 134, 135, 136, 167, 193, 415, 629-633
ncer in, by organs and parts, 123-125
ortality from diabetes in, 193-194
ortality from sarcoma in, 167
ation, cancer, value of, 204
Scotia, 745
nberg, Germany, 660
ig and cancer, 199, 207
ig, educational value of, 215
ion and cancer, 132, 153, 174-179, 182, 183, 192-193 (see diet and metabolism)

TY and cancer, 174, 183 (see weight and anthropometry)
ation and cancer, 48-76, 152, 219, 305-315
ortality statistics of, 73
y organs and parts, 74-75
ation and tumor, 48

Œsophagus, cancer of, 118, 183
Œsophagus, stomach and liver, cancer of, 122-125
Ohio, 108
Old age, cancer in extreme, 14, 38, 42, 109, 114, 153-154, 183, 204 (see age)
Old persons, proportion of, 204
Omaha, Nebraska, 128, 542
Oncologic Hospital, 159
Oncology, definition and terminology of, 1, 4, 6, 20
Ontario, Canada, 39, 741
Operable and inoperable cancers, proportion of, 165
Operations, early record of, 5
and cancer death rate, 40 (see surgical)
Operative treatment, results of; 113, 215
Organs and parts, cancer mortality by, 17, 19, 27, 32, 74-75, 77, 87, 88, 100, 110-111, 113-114, 115, 116-125, 129-130, 139, 141, 158, 159, 163, 177, 219, 228-231, 316-775.
international statistics of, 239-261, 316-775
Orifices of body and cancer, 156
Osaka, Japan, 718
Osteoma, definition of, 9, 10, 275
Ovarian tumors, 110, 428-429
and cancer, 120
Ovary, cancer of, 100, 110, 118, 121 (see conjugal condition and generative organs)
Overeating and cancer, 178 (see diet and nutrition)
Overfeeding and thyroid carcinoma in fish, 181-182
Overnutrition and cancer, 174, 178, 220 (see diet and nutrition)
Overweight and cancer, 153, 220 (see anthropometry and weight)

PAIN, clinical significance of, 155, 169, 170
Painters, 313
Palermo, Italy, 693
Pallor, clinical significance of, 169-170
Pancreas, cancer of, 118, 121, 192, 193
Paperhangers, 313
Papermakers, 313
Papilloma, definition of, 8, 275
Paraffin industry, 49, 54, 55, 56, 58, 61, 64, 70
Paraná, Brazil, 766
Parasite, cancer, 196-197, 202-205, 783
Parasites, plant, classification of, 198
Parasitic theory of cancer, 195-196, 197, 198, 202-205, 220 (see infection)
Parasitical origin of cancer, 181, 202-205, 207, 220
Parimaribo, Dutch Guiana, 753-754
Paris, France, 671-672
Patent-fuel industry, 51-54, 61 (see tar and paraffin workers)
Pathology of cancer, historical and geographical, 104

INDEX OF SUBJECTS

Paupers (see poverty)
Peddlers, 314
Pelotas, Brazil, 767
Pembrey and Ritchie, on tumors, 4
  cancer classification of, 269-270
Penang, Straits Settlements, 137-138, 712
Pennsylvania, 108, 425
Pennsylvania Cancer Commission, 165
Peritoneum, cancer of, 118
Peritoneum, intestines and rectum, cancer of, 77, 110-111, 114, 115, 130, 132, 139, 158, 159, 163, 228-265, 316-776
Personal history of cancer patients, 116-121
Peru, 140-141
Petrograd, Russia, 697
Petroleum industry, 58 (see patent-fuel industry and tar and paraffin workers)
Pharynx, cancer of, 118, 119
Philadelphia, Pennsylvania, 128, 543-550
Philippine Islands, 137, 138, 178
Phipps, Henry, Institute, 188
Phthisis and cancer, 34, 187-188
  marital infection in, 206 (see tuberculosis)
Physical condition and cancer, 153-155 (see personal history and weight)
Physicians, 57, 306-312, 314
Physique and cancer, 152 (see anthropometry and build)
Pitch industry, 49-55, 61, 69
Pitch ulceration and cancer, 69 (see tar and paraffin workers, also patent-fuel industry)
Pittsburgh, Pennsylvania, 128, 551-554
Plant parasites, 198
Plants, cancer in, 63, 68, 152, 179
Plasterers, 72, 313
Plumbers, 57, 314
Pneumonia and cancer, 45, 118, 440-441
Poles, cancer among, 680
Policemen, 314
Polynesians, cancer among, 738
Poor Law institutions, cancer mortality in, 161-162
Population statistics, by age and sex, 435
Porters, 57, 314
Porto, Portugal, 696
Porto Rico, 757
Portsmouth, England, cancer education in, 216, 781-782
Portugal, 135, 694-696
Portuguese Guinea, 137
Portuguese in Hawaii, cancer among, 739
Portuguese India, 137
Post-mortem records (see autopsy)
Post-natal growth and cancer (see growth and development)
Potassium balance, 179
Potters, 57, 306-313
Poverty and wealth and cancer, 90, 101, 122, 150-151, 177, 203 (see well-to-do)
Precancerous conditions, 155, 156, 157, 158, 220
Predisposition, 171
Prevention of cancer, 215, 777-785 (see education)
Previous illness, 154
Primary seat of growth, 116-121
Primitive races, cancer among, 15, 36, 122, 146, 147 (see civilization)
Prince Edward Island, 745
Printers, 56, 306-313
Prisoners, cancer among, 55, 58
Problem, cancer, nature of, 2, 47, 105, 217-221
Proctoscope, use of, 158
Professional classes, 56
Prognosis, 157, 169, 170-171
Proportionate cancer mortality, 13, 29, 77, 93, 112-113
  in insurance experience, 72, 73, 89, 91, 93, 94
  among rich and poor, 101-102
  by sex, 440
Prostate gland, cancer of, 119
Prostitution and cancer, 189 (see syphilis)
Protective regulations, 52-53, 66, 69
Protein excess and cancer, 174 (see nutrition)
Providence, Rhode Island, 128, 555-557
Prudential (America) mortality experience of, 13, 101-103, 262
Prudential (London) mortality experience of, 90, 367-369
Prussia, 107, 213, 646-647
Psammoma, 275
Psychological aspects of cancer, 47, 208 (see insanity and worry)
Public agitation, objections to, 208
Public institutions, cancer deaths in, 161-162
Publications on cancer, 215-217 (see literature)
Public-service employees, 315

QUARRYMEN, 56, 305-312
Quebec, city of, Canada, 744
Queensland, Australia, 138, 731-732
Question form for cancer statistics, 27, 285, 290-304

RACE, 14-16, 36, 42, 131, 132, 152, 172, 234-237, 399, 431-775 (see Chinese, Egyptians, Japanese, negroes, primitive races, etc.)
Radio-activity, 54, 67, 185-186, 202, 205, 211
Radiological examinations, 5
Radium Institute of London, 210, 211, 221
Radium and radiotherapy, 209-212, 220
Railway employees, 71, 307-315
Rainfall, mean annual, 143
  and cancer, 191, 192 (see climate, dampness and humidity)

, of growth, 168 (see growth and development)
es of cancer, 122
endations on cancer control, 777-778
and blanks, cancer, appendix of, 284-304
s, old, cancer in, 198
cancer of, 119, 121, 158 (see peritoneum and intestines)
ice, cancer, problem of, 164-165, 169, 220
r-General of England and Wales, reports of, 13, 46, 98, 131, 162
tion Area, United States (see United States)
n rate in life insurance, cancer, 95
cancer mortality, by sex, specified organs and parts, 601, 615, 631, 676
and cancer, 151 (see Jews)
lculi and cancer, 187
ictive life and cancer, 204
, cancer, problems of, 2, 166, 217, 221 (see Imperial Cancer Research Fund and hospital statistics)
ice, natural, to cancer, 182
ory organs, cancer of, 32, 33 (see lungs, miners and tuberculosis)
ant-keepers, 75 (see innkeepers)
313
tism and cancer, 154, 183, 187, 190-192, 205, 220
sland, 108, 425, 467-469
l poor and cancer (see poverty and wealth)
id, Virginia, 128, 558-561
aneiro, city of, Brazil, 762
Janeiro, federal district of, Brazil, 762-763
ods and cancer, 203 (see dampness and Thames Valley)
er, New York, 128, 561-562
ulcer, 159, 195, 203
n-rays, 66-67, 122, 147, 210-211 (see X-ray dermatitis)
taly, 691
313
de Sante Fé, Argentina, 771
am, Holland, 666-667
ia, 135-136, 701
ians, cancer among, 680, 686
firmary of Edinburgh, 81
workers, 65, 313
ncer death rate, 13
135
Jews, cancer among, 148 (see Jews)
ans, cancer among, 680, 686
(see seamen)
, New Brunswick, 746
, Missouri, 128, 570-571
St. Paul, Minnesota, 128, 572
St. Thomas, Danish West Indies, 751
St. Thomas and Principe, 707
Salesmen, 314
Saloon-keepers, 57, 71, 83, 314 (see alcoholism, bartenders and liquor-dealers)
Salvador, 140-141
San Francisco, California, 128, 129, 130, 562-565
Sanitary precautions and cancer, 53, 54
San Salvador, Salvador, 760
Santiago de Chile, city of, Chile, 141, 773
Santiago de Chile, province of, Chile, 773
Sao Paulo, Brazil, 766
Sarcoma, definition of, 9, 10, 14, 34, 102, 167, 275
    incidence of, 32, 99-100, 161, 167
    mortality from, 14, 159
Sarcomata and carcinomata, 131, 153, 167, 196
Savannah, Georgia, 128, 129, 565-567
Sawyers, 72, 313
Saxony, 649
Schizomycetes in plants, 198
Schneeberg mining district, cancer in, 61, 68, 69
School-teachers, 306-312, 314
Scirrhus, classification of, 268, 273
Scotland, 39, 134, 135, 167, 416, 613-615
    cancer in, by organs and parts, 122-125
    deaths from sarcoma in, 167
Scrofula and cancer, 81, 187
Scrotum, cancer of, 49, 50, 51, 52, 55, 56, 59, 60, 61, 62 (see chimney-sweeps)
Seamen, 57, 62, 65, 72, 204, 306-314
Season, cancer mortality by, 113, 441
Seattle, Washington, 128, 567-568
Secondary causes in cancer, 44-46
Senility and cancer, 13, 14, 153 (see growth and development and old age)
Serbia, 135, 698-699
Serbians, cancer among, 686
Sex and cancer, 11, 12, 110-114, 131, 152, 232-233
    international statistics of, 224-265, 305-775 (see males and females and generative organs)
Seychelles, hospital statistics of, 713
Shale-oil workers, 54
Shanghai, China, 137, 138, 715
Sheffield, England, 607-608
Shelf, England, cancer education in, 783-785
Ship and boat builders, 313
Shoemakers, 48, 57, 71, 306-313, 315
Siam, 178
Sierra Leone, 36, 136-137, 705-706 (see Africans and creoles)
Singapore, China, 137, 138, 712
    hospital statistics of, 712
Single years of life, cancer mortality by, 131
Sinhalese, cancer among, 15, 710

Skin, cancer of, 32, 33, 51, 52, 62, 66, 77, 110, 111, 114, 115, 119, 121, 122-125, 130, 139, 158, 159, 211, 215, 236-265, 316-775
Skotographic action, 67
Slaves, cancer among, 15 (see negroes and creoles)
Slavs, cancer among, 680
Slovaks, cancer among, 686
Slovenes, cancer among, 680
Smelters, 315
Smoke and cancer, 64 (see soot)
Smoking and cancer, 117, 121, 138, 185-186, 220
Social conditions and cancer, 76 (see poverty and wealth)
Society for Control of Cancer, American (see American Society for Control of Cancer)
Soil and cancer, 152, 191, 202, 203, 205
Soil and goitre, 180
Soldiers' homes, cancer in, 162
Soot and cancer, 49, 58, 61, 63, 70 (see chimney-sweeps)
South Africa, Union of, 703-704
South Australia, 138, 730-731
South Dakota, 426
Southern cities, 128, 234-235, 474
Southern statistics, 42
Spain, 39, 107, 135, 693-694
Spinsters, cancer among, 98 (see conjugal condition)
Spontaneous cancers, 207
Springfield, Massachusetts, 128, 568-570
Standard death certificate, 27
Standard population, 35
Standardized death rates, 12, 13, 71, 107-108, 126-127, 129, 220
Statistical analysis, principles of, 3
  criticisms of, 7, 22, 23, 25, 37, 41
  difficulties of, 17
  elements of, 11
  errors of, 12, 18, 21, 25
  fallacies of, 2, 3, 22, 23, 41, 43, 162
  limitations of, 2, 21, 26, 41, 126, 141
  methods of, 1, 9, 11, 27, 145
  requirements of, 76, 130-131
Statistical investigations, 34
Statistical research, principles of, 22, 217
Statistical studies, value of, 11
Statistical study of cancer increase, 34
Statistics of cancer, 3, 25, 26, 58, 81, 97-98, 163, 171, 217, 224-264, 305-775
  by duration, 166
  early London, 23
  educational value of, 77, 103
  fundamental law of, 3
  hospital, 78, 158-163, 221
  inaccuracies of, 16
  inadequacy of, 130-131
  international, 106-108, 224-265, 305-775
  limitations of, 126
  need of scientific study of, 25-26
  occupational, 48-76, 305-315
  by organs and parts, 228-231, 316-775
  post-mortems, 160
  practical utility of, 218
  sources of, 21
  standardization of, 220
  supplementary census inquiry of, 304
Statistics of precancerous conditions, 156
Stockholm, Sweden, 637
Stomach, cancer of, 58, 119, 121, 158, 166, 170, 176, 177, 179, 187, 210, 228-231, 236-265, 302-303
  estimated mortality from, 77
  mortality from, 110-111, 114, 115, 158, 159, 163
Stomach, diseases of, increase in, 37
  ulcer of, 110 (see ulcer and gastric ulcer)
Stomach and liver, cancer of, 15, 110-111, 123, 130, 139
  international statistics of, 228-231, 236-265
Stomach, liver and œsophagus, cancer of, 122-125
Stone cancer, 168
Straits Settlements, hospital statistics of, 711
Street-cleaners, 314
Sudanese, cancer among, 136
Suicide and cancer, 146
Suicide, mortality from, 440-441
Sulphate of ammonia and cancer, 64
Sulphuric acid and cancer, 63-65 (see smoke and soot)
Sulphuric substances and cancer, 174
Surgery, observations on, 128
Surgical aspects of cancer, 162, 163, 164, 220
Surgical infection, 206-207
Surgical operations in cancer, 5, 6, 146, 157, 162, 206, 288-289
  effect on cancer death rate of, 40
  results of, 210
Swamps and cancer, 197 (see dampness and rainfall)
Sweden, 40, 135, 634-636
  cancer census of, 76, 635-636
Sweden and Finland, 641
Swellings, clinical significance of, 169-170
  definition of, 5
  differential diagnosis of, 5
Swiss Goitre Commission, 180
Switzerland, 40, 46, 134, 135, 136, 167, 219, 248-249, 415, 674-677
  cancer in, by organs and parts, 123-125
  deaths from sarcoma in, 167
  excessive cancer mortality of, 134
Sydney, New South Wales, 726-727
Symptoms, early, importance of, 169-170, 212-215
  clinical, 171 (see diagnosis)
Synthetic-dye industry, 68 (see aniline-dye workers)
Syphilis and cancer, 116-121, 187, 188-190, 220

INDEX OF SUBJECTS

TABULATION and analysis, uniformity in, 2, 26, 27
Tailors, 71, 72, 306-312, 315
Tamils, cancer among, 15, 710
Tanchou, cancer theory of, 23
Tanners, 73, 306-313
Tar and paraffin workers, 49, 50, 54, 56, 59, 61, 70 (see patent-fuel industry)
Tasmania, 138, 733-734
Teachers, 71, 72, 306-312, 314
Teeth, defective, and cancer, 119-120
  and cancer of tongue, 186
Temperature, mean annual, 143 (see climate)
Temperature of food and cancer, 215
Terminal diagnosis, accuracy of, 22, 170 (see diagnosis)
Terminology, cancer, difficulties of, 4 (see classification)
Textile-workers, 71, 72, 74, 75, 306-313
Thames Valley, cancer in, 203
Throat, cancer of, 119, 120
Thyroid carcinoma, 181-183 (see goitre)
Thyroid gland, hypertrophic enlargement of, 180
Tin-plate workers, 65, 69, 70
Tinsmiths, 313
Tissue tension, theory of cancer, 205
Tobacco, effect of, 135, 185-186 (see smoking)
Tobacconists, 306-313
Tokyo, Japan, 717-718
Tongue, cancer of, 120, 121, 135, 157, 184, 185, 186 (see buccal cavity)
Topography and cancer, 152, 191, 192, 196-198, 203-204 (see geology and soil)
Toronto, Canada, 741-742
Toxins, specific cancer, 177
Transplanted cancer among animals, 207
Transportation employees, 62, 74, 315
Transvaal, 136
Traumatism and cancer, 48, 49, 59, 60, 116-121 (see accidents, irritation and occupation)
Treatment of cancer, 169, 171 (see surgery, radium and cancer cures)
Trinidad, 750
Tropics (see latitude)
Trujillo, Peru, 141, 761
Tuberculosis and cancer, 45, 116-121, 187-188, 203, 206, 220
Tuberculosis, decline in mortality from, 46, 188
  in husband and wife, 206
  mortality from, 188, 440-441 (see phthisis)
Tucumán, province of, Argentina, 771
Tumor, mortality from, 1, 109, 110, 111,
  benign, 4, 109, 155, 428-429
  of bladder, 59
  characteristics of, 4
  classification of, 8-11, 22, 167, 267-283
  definition of, 4
  in early life, 14
  early mortality from, 7
  encysted, 6
  formation and trauma, 60
  Frankfurt a/M., mortality from in, 32, 33
  literature on, 4
  non-malignant, classification of, 20
  non-malignant, definition of, 4
  non-malignant, mortality from, 37, 428-429
  and occupation, 48
  old age, in extreme, 14
  pathology of, 6
  problem, involved nature of, 167
Turin, Italy, 692
Turkey, 185
Turpentine-workers, 51
Typhoid fever, mortality from, 440-441

ULCER, gastric, 156
  of intestines, increase in, 37
  mortality from, 429
  precancerous nature of, 156
  of stomach, 38, 281
Ulcers and cancerous complaints, 6
  decrease in mortality from, 37
  management of, 22
Underfeeding and cancer, 176 (see diet and malnutrition)
Undertakers, 314
Underweight and cancer, 220 (see anthropometry, nutrition, obesity and weight)
Uniformity in statistics, 26, 27, 218
Union of South Africa, 703-704
United Kingdom (see England and Wales)
United States, 12, 40, 77, 107, 108, 114, 123-125, 126-132, 139-141, 230-233, 238-239, 418-581
  estimated mortality from cancer in, 77, 146
  states and cities of, 450-581
United States Bureau of Mines, 212
United States Fish Commission, goitre research of, 180-181
United States Registration Area, cancer mortality of, by organs and parts, 123-125 (see United States)
  cancer statistics of, in detail, 418-449
Upholsterers, 72, 313
Urban cancer death rate (see cities)
Urban cancer mortality of England and Wales, 602
Urban and rural cancer death rates, 13, 431, 602, 633
Urban standardized cancer death rates, 13
Urinary organs, 32, 33
Uruguay, 39, 123-125, 140-141, 256-257, 416, 774-775
  cancer in, by organs and parts, 123-125
Utah, 426

INDEX OF SUBJECTS

Uterine cancer, 149, 154, 158 (see generative organs)
and syphilis, 189
Uterine cancer blank, 296-297
Uterine tumors, benign, 110, 280, 429
Uterus, cancer of, 99, 100, 101, 110, 111, 115, 120, 121, 154, 157-158, 166, 169, 171, 174, 212, 214, 215, 216
among Jewesses, 148, 149, 150, 151, 688 (see conjugal condition)

VAGINA, cancer of, 120-121
Variations in cancer frequency, 125, 147
Vascular-tissue type of cancer, 10
Vegetarianism and cancer, 136, 138, 175, 176, 178, 179 (see diet)
Venereal disease and cancer, 116-121
Venezuela, 140-141, 760
Vermont, 108, 425, 470-471
Victoria, Australia, 138, 727-729
Vienna, Austria, 136, 681-683
cancer mortality of Jews in, 149-150
Vienna General Hospital, 194
Virchow, cancer theory of, 6, 202
Vital statistics, 3-4, 19, 22, 34, 42, 44, 73, 86, 122, 125, 131, 218, 305-775 (see statistics, mortality and autopsy records)
Vulva, cancer of, 56

WAGON-MAKERS and wheelwrights, 313
Waiters, 314-315
Walshe, cancer treatise of, 6, 7
cancer classification of, 268
Warsaw, Russia, 698
Warts and cancer, 187, 782
Washington, 108, 426
Washington, D. C. (see District of Columbia)
Watchmen, 314
Water and cancer, 152, 172, 199
Water and goitre, 180
Water courses and cancer, 204 (see Thames Valley)

Wealthy, cancer among, 122, 150-151 (see poverty and wealth, social condition and well-to-do)
Weight and cancer, 97, 169
Weight and uterine cancer, 154 (see anthropometry, obesity, overweight, physical condition, underweight, etc.)
Well-to-do, cancer among, 55, 56, 90, 91, 101 (see poverty and wealth, also wealthy)
Western Australia, 138, 734-735
Western Hemisphere, 139-141
cancer mortality, by latitude, 142-144
West Indies, 80, 140
Whiskey-drinking and cancer, 183
White, cancer classification of, 7, 10-11, 272
White and colored, cancer among (see race)
Widowed and divorced, cancer among, 98 (see conjugal condition)
Windward and Leeward Islands, 750
Wine-drinking and cancer, 183
Winnipeg, Canada, 744
Wisconsin, 108, 426
cancer census of, 35
Womb, cancer of, 215 (see uterus)
Wood-workers, 62, 74
Workmen's compensation and cancer, 48, 50, 51, 59 (see occupational disease)
World, cancer mortality of civilized, 106-107, 146, 224-264, 305-775
population of, estimate of, 21
Worry and cancer, 207-208, 220 (see insanity)
Württemberg, Germany, 104, 648

X-RAY dermatitis, 59, 66, 122, 174, 175, 184, 211
X-ray treatment, 211
X-ray workers, 66-67, 122 (see Roentgen-rays and protective regulations)

ZURICH, Switzerland, 678